JANUARY 25, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Metal Powders Ease Production Headaches

- page 88

TOOL BUILDERS FLEX SALES MUSCLES
With New Products, Leasing, p. 47

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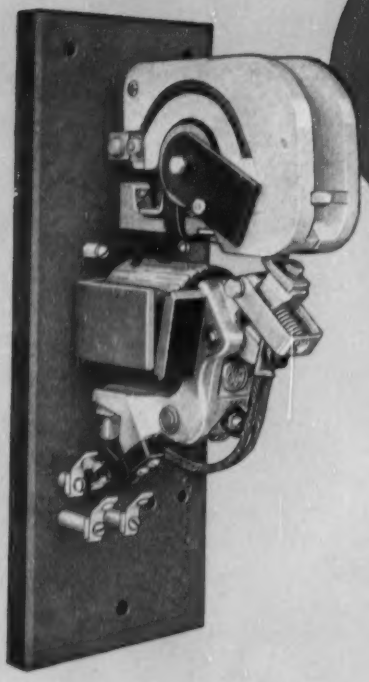
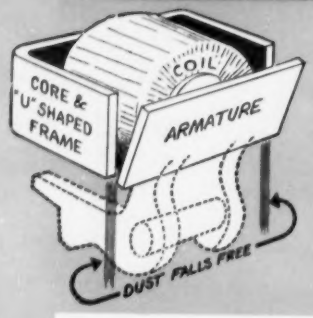
IMPROVED

EC&M *LINE-ARC* Contactors

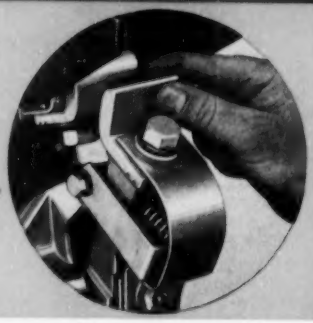
CUT OPERATING COSTS





Solves the dust problem —lets magnetic dust fall free.

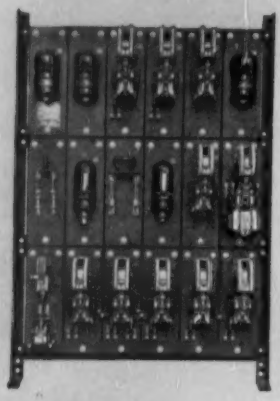
Contacts remain cool in operation — have long life.



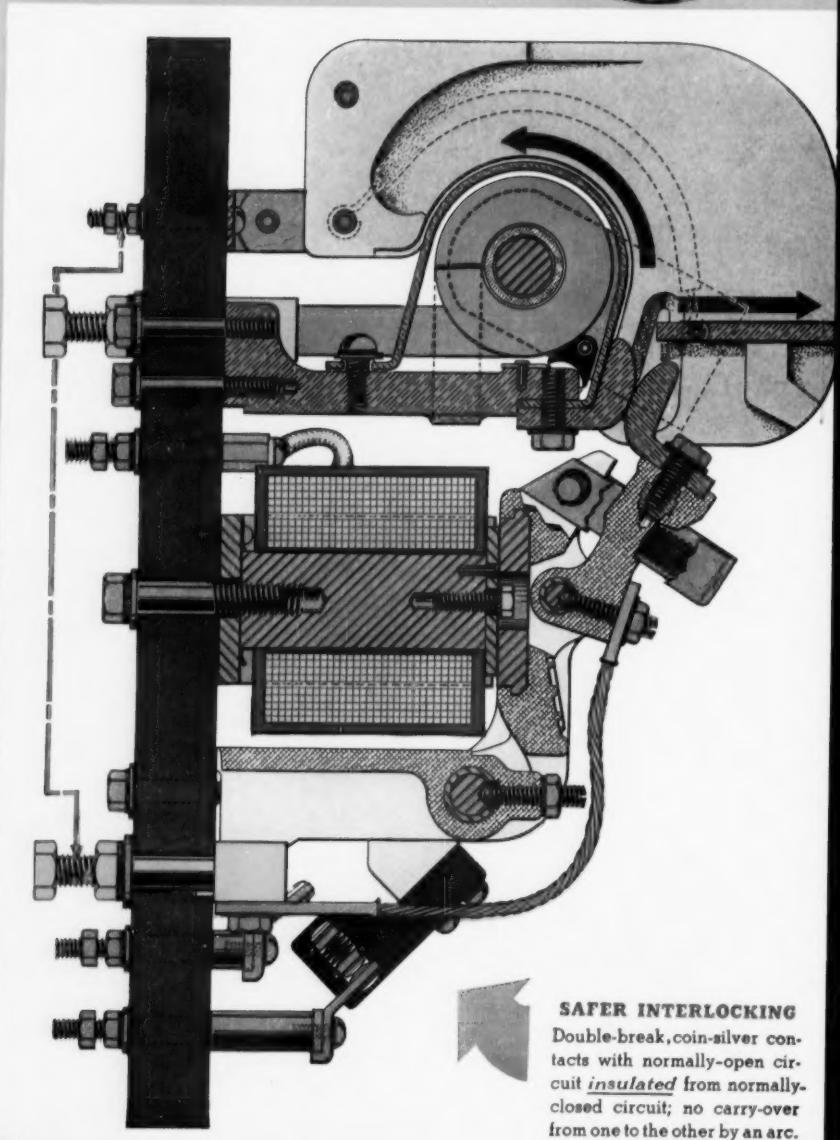
Improved EC&M LINE-ARC Contactors allow the magnetic dust to fall free. They have no mechanical shelf in the magnetic path to catch it. They use safer electrical interlocks.

The well-known EC&M LINE-ARC principle provides high arc-rupturing ability and long contact life through cool contact operation.

EC&M Contactors of LINE-ARC design have a long-standing reputation for efficient operating results. These improved contactors give performance far superior to any previous standard of comparison. When buying crane and mill auxiliary controllers—specify EC&M LINE-ARC Contactors.



CRANE CONTROLLER



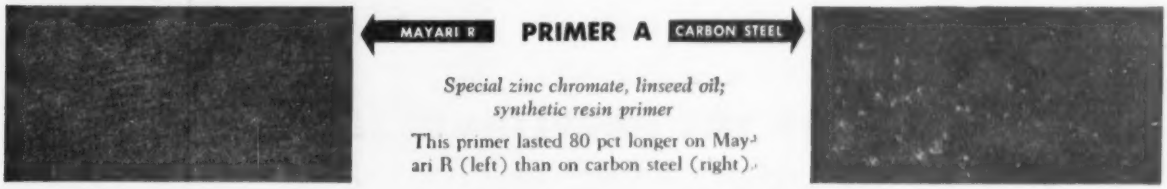
SAFER INTERLOCKING
Double-break, coin-silver contacts with normally-open circuit *insulated* from normally-closed circuit; no carry-over from one to the other by an arc.

1758

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

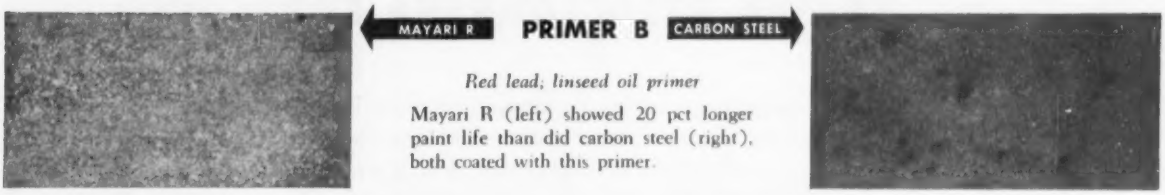
Tests show MAYARI R holds paint 20% to 80% longer

A comprehensive series of tests was run to determine the relative paint-adherence of Mayari R steel and ordinary carbon steel. Five specimens of each of these steels in 4-in. by 4-in. by 1/4-in. angle sections with typical partly rusted scale surfaces were wire-brushed, and each given a coating of one of five different types of primer paint at a uniform dry film thickness of 2.5 mils. These painted sections were then placed at a 45-degree angle in a corrosive industrial atmosphere. After the specimens had been exposed under identical conditions for the same period of time, adherence results were as shown below.



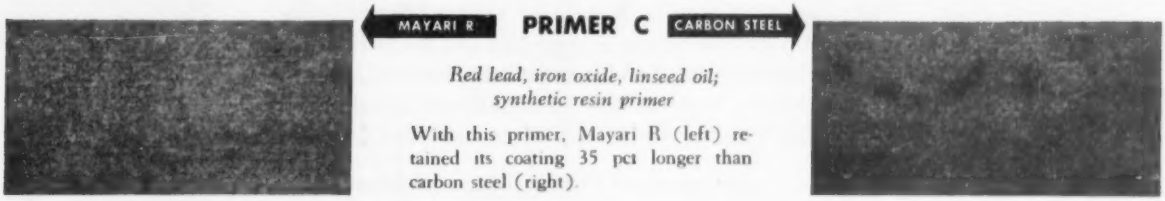
Special zinc chromate, linseed oil; synthetic resin primer

This primer lasted 80 pct longer on Mayari R (left) than on carbon steel (right).



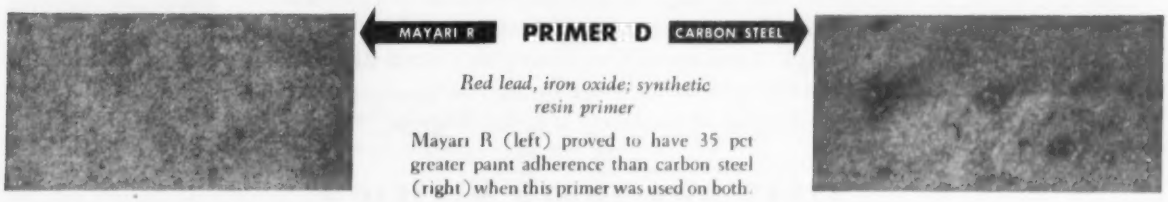
Red lead, linseed oil primer

Mayari R (left) showed 20 pct longer paint life than did carbon steel (right), both coated with this primer.



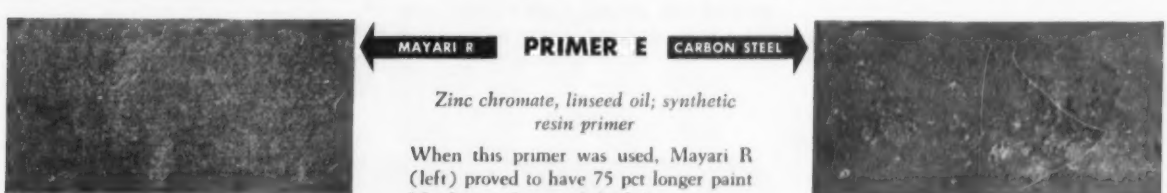
Red lead, iron oxide, linseed oil; synthetic resin primer

With this primer, Mayari R (left) retained its coating 35 pct longer than carbon steel (right).



Red lead, iron oxide; synthetic resin primer

Mayari R (left) proved to have 35 pct greater paint adherence than carbon steel (right) when this primer was used on both.



Zinc chromate, linseed oil; synthetic resin primer

When this primer was used, Mayari R (left) proved to have 75 pct longer paint life than carbon steel (right).

This research investigation, confirmed by the experience of Mayari R users in many industrial applications, shows how important savings in paint and labor are made possible through the use of Mayari R low-alloy, high-tensile, corrosion-resisting steel.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

THIS MAY BE THE PROFITABLE IDEA YOU'VE BEEN LOOKING FOR

Here's a tough fabricating job that requires high ductility from the metal involved. That's one of the big reasons why Republic ELECTRUNITE Stainless Steel Tubing was used.

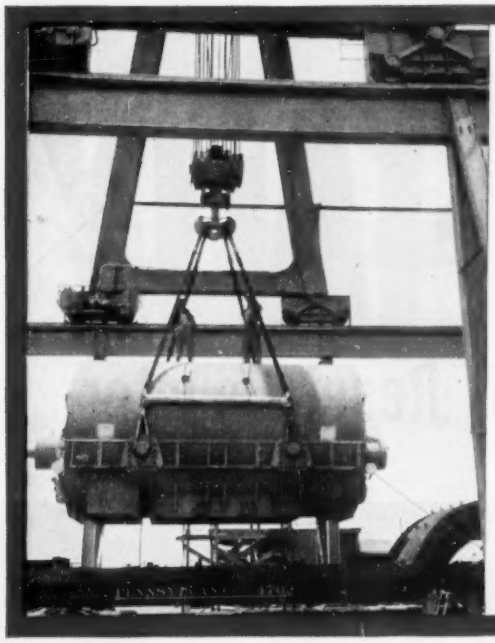
The tubing on that coffee bowl is ¾" O.D. x 22 gage Stainless Steel. First, the tubing is expanded and the bead is upset. Then the expanded end is annealed before rolling into the coffee bowl. It all adds up to some drastic fabricating. And a good product for Bloomfield Industries of Chicago.

What about your product? Do you have a problem Stainless Steel Tubing might solve? Have you looked into the possibility of using Republic ENDURO Stainless Steel Pipe or Tubing? If you haven't, a call to your nearest Republic office can start you on the way making your product better or even cheaper to produce. Or both. Write to:

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
253 EAST 131st STREET • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

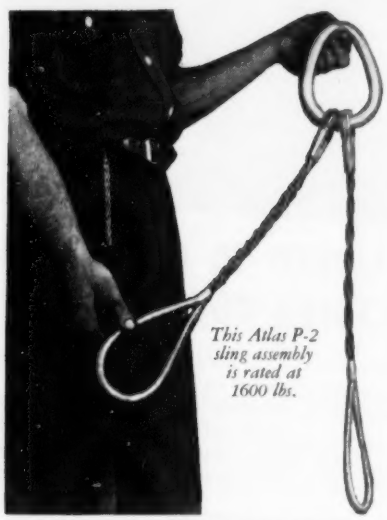
Republic
REPUBLIC STEEL
ELECTRUNITE
STAINLESS STEEL TUBING AND PIPE

PRODUCED BY THE MAKERS OF ELECTRUNITE — THE ORIGINAL ELECTRIC WELDED BOILER TUBE



Another job well done with Macwhyte Slings!

408,600-LB. GENERATOR SAFELY HANDLED WITH MACWHYTE ATLAS BRAIDED SLINGS



This Atlas P-2 sling assembly is rated at 1600 lbs.

Macwhyte slings are available for any load regardless of size. Our experience on thousands of applications is yours for the asking. Just write to Macwhyte Company, Sling Dept., Kenosha, Wis.

Macwhyte 8-Part Atlas Type 1 Round-braided Wire Rope Sling.

Safe installation of a $2,000,000 generator at the Valley Steam Plant of Los Angeles' Department of Water and Power required expert handling and finest rigging.

That's why Macwhyte Atlas Round-braided Wire Rope Slings were chosen to unload and install the largest and heaviest single freight shipment ever handled by the Southern Pacific Railroad. Lift was made with a 180-ton Moffett Crane using Macwhyte's Monarch Whyte Strand Wire Rope.

Macwhyte's *balanced* braiding gives Atlas Slings greater flexibility, longer life, resists spinning and kinking. Macwhyte slings and wire rope offer better service on any lifting job, large or small. Recommendations will be promptly made on request.

MACWHYTE SLINGS

Complete line of slings to fit your needs!

Three types of body are available: Atlas Round-Braided, Drew Flat-Braided, Monarch Single-Part. All are made to order in any size for any job. Suggestions for slings to meet your needs are promptly available.

READY now—new Circular Number 5308 showing strengths and safe-loads at various angles plus many sling designs. Ask for 5308.

See the hundreds of slings in Macwhyte Sling Catalog S-8

MACWHYTE COMPANY

2912 Fourteenth Ave., Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable, Safe-Lock Assemblies, Monel Metal and Stainless Steel Wire Rope.

Mill depots: New York • Pittsburgh • Chicago St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

10678

New!

VARY-TALLY

Multiple-Unit Reset Counter

DESIGNED TO COUNT ANYTHING COUNTABLE

this new Vary-Tally can be supplied in any combination up to 6 banks high, 12 units wide, with the counting units arranged compactly on stands in tiers. Now check these special features of Veeder-Root design and construction:

- Easily Readable from any Angle . . . Bold Figures Always Centered in Window . . . No Glare . . . Figures not Covered by Fingers in Operation
- Easily Portable, yet Ruggedly Built for Long Wear
- Separate Counting Units Can be Rotated like Tires on a Car, to Distribute Wear Evenly
- All Parts Corrosion-Resistant
- Working Parts of Hardened Steel
- Operation Not Affected by Extreme Heat or Cold
- Individual Tag Above Each Counter-Window — Not Strip Tabs
- Veeder-Root Quality in Every Part

Now what's on *your* mind, that Vary-Tally can help you count? Write for news sheet and prices.

"The Name that Counts"

VEEDER-ROOT INC.

HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C. • Montreal 2, Canada • Dundee, Scotland • Offices and Agents in Principal Cities

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 4 January 25, 1954

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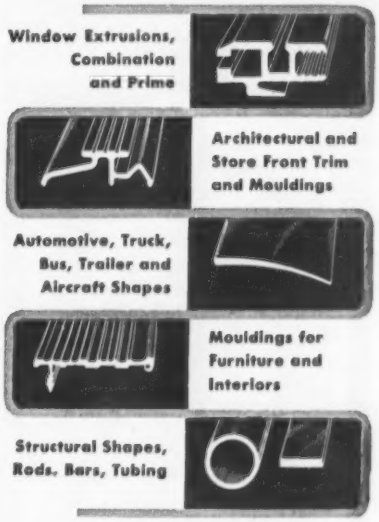
PE ALUMINUM EXTRUSIONS
designed and produced to fit your needs


Window Extrusions, Combination and Prime
Architectural and Store Front Trim and Mouldings
Automotive, Truck, Bus, Trailer and Aircraft Shapes
Mouldings for Furniture and Interiors
Structural Shapes, Rods, Bars, Tubing

If your production requirements call for a specially-designed aluminum extrusion, the skill and experience of PE design engineers and production men are available to you to help answer your specific needs. Or, it may be that a solution to your requirements can be found among the 4000 standard rods, bars, shapes, and tubing currently cataloged by Precision Extrusions and available without additional die service charge.

PERSONALIZED SERVICE and specialization in aluminum extruding assures you of prompt handling of your inquiry, careful production supervision, and extrusion quality meeting the highest standards of the industry.

COMPLETE FACILITIES include design engineering, die making, billet casting, extrusion production, and standard finishing operations.

ENGINEERING ASSISTANCE is available without obligation. If your present or future plans call for quality aluminum extrusions in standard or special shapes, call on PE, or *write, on your company letterhead, for our new complete catalog.*

QUALITY • SERVICE
PE
PRECISION EXTRUSIONS
BENSENVILLE, ILLINOIS
CHICAGO: TUxedo 9-1701 • BENSENVILLE 98

THREADED SPECIALTIES

EYE BOLTS

by an exclusive method

Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes 1/4" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MEN"

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

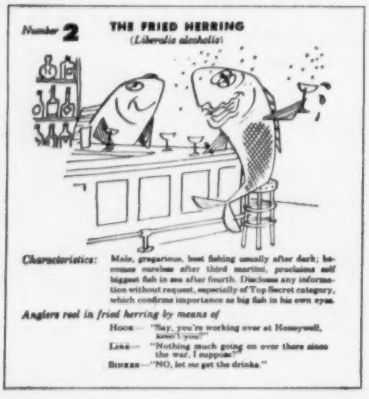
THE PEACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.

behind the scenes

Queer Fish

This drawing, one of nine prepared by Minneapolis-Honeywell, satirically portrays one of the most flagrant security risks to be found in industry —the employee who becomes careless after the third martini and discloses, without request, top secret data.


Number 2
THE FRIED HERRING
(Liberalis alcoholis)
Characteristics: Male, gregarious, best fishing usually after dark; becomes careless after third martini, proclaims self biggest fish in sea after fourth. Discloses any information without request, especially of Top Secret category, which confirms importance as big fish in his own eyes.
Anglers reel in fried herring by means of
Hook— "Say, you're working over at Honeywell, aren't you?"
Line— "Nothing much going on over there since the war, I suppose?"
Sinker—"NO, let me get the drinks."

The drawing, together with the eight other similar profiles, was distributed to M-H aeronautical and ordnance division employees who handle classified material. Some of the others are: "The Common Carp," (*Jaketa, Jaketa, Jaketa*); "The Large-Mouthed Bass," (*Loquacius telephonus conversationis*); "The Blew Marlin," (*Depositus hurryosis*); and "The Small-Mouthed Bass," (*Confidentialis exchangeis*).

In the words of Teenage Tina, we think this campaign is *real cool*. It makes its point easy-to-take.

Tell Me Quick, Tell Me True

We've all heard a lot about the period of hard selling which industry faces during the next 12 months. Last week Cal Fisher, STEEL's New England regional manager, was speaking to Harold Leever, vice president of MacDermid Inc., Waterbury, Conn., on this very same subject when Mr. Leever dipped down into a desk drawer and pulled out a sheet of paper with the following written upon it:

I see that you've spent quite a big wad of dough,
To tell me the things YOU think I should know;
How your plant is so big and so fine and so strong,
And your founder had whiskers so handsomely long.

So he started the business in old "92"!
How tremendously int'resting THAT is . . . *to you;*
He built up the thing with the blood of his life,
(I'll run home like mad and tell that to my wife!)

Your machinery is so modern and, oh, so complete,
Your "rep" is so flawless, your workers so neat;
Your motto is "Quality" . . . with a capital "Q"—
No wonder I'm tired of those words —"Yours" and "You"!

So tell me quick and tell me true,
(Or else, my friend, to hell with you!)
Less—"how this product came to be;"
More—what the damn thing does for me!

Will it save me money or time or work,
Or hike my pay with a welcome jerk?
What drudgery, worry, or loss will it cut,
Can it yank me out of a personal rut?

Will it practically wipe out our cost of production,
Eliminate service costs, speed up construction?
Will it make all the brass hats think I am the guy,
Who has transformed our business from peanuts to pie?

So tell me quick and tell me true,
(Or else, my friend, to hell with you!)
Less—"how this product came to be;"
More—what the damn thing does for me!
(Apologies to Victor Schwab, Schwab & Beatty, Inc., New York)

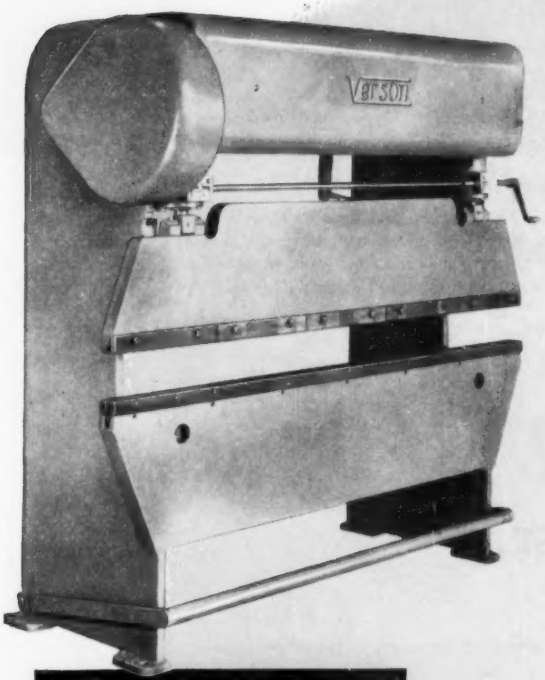
There, gentlemen, is a rhyme with plenty of reason! Could well be your salesman's "Credo" for '54.

Shrdlu

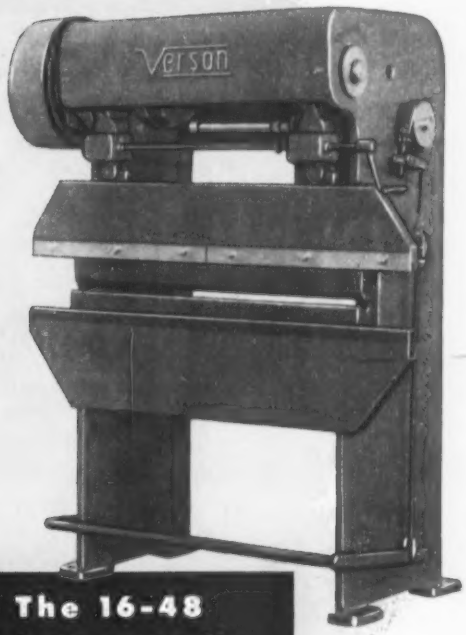
(Metalworking Outlook — Page 39)

Now, for the first time...

Standard Verson Press Brakes Available from *Stock!*



The 1062
25 tons capacity
(16 ga. x 78")
$2,190.00 as shown



The 16-48
15 tons capacity
(16 ga. x 48")
$1,455.00 as shown

Standard Dies Also Available

Standard 90° "V" dies for these press brakes are also available from stock. 78" long set for the 1062 is priced at $124.00. 48" long set for use in the 1062 or 16-48 is priced at $93.00. (Prices are for dies to handle 16 ga.).

To meet the demand for quality press brakes at modest cost and available for prompt delivery, Verson now offers two standard models *from stock.* For the small shop, it means big press standards of design and construction at prices that will fit almost any budget. For the larger shop, it means an economical answer to handling the smaller jobs without tying up big expensive machines.

Important, too, is the fact that you can order these machines as easily as buying an automobile. There is no involved proposal . . . no long delay awaiting delivery. These standard machines are offered at a standard price and shipped from stock.

Your Verson dealer can give you further information or write direct.

A Verson Press for every job from 60 tons up.

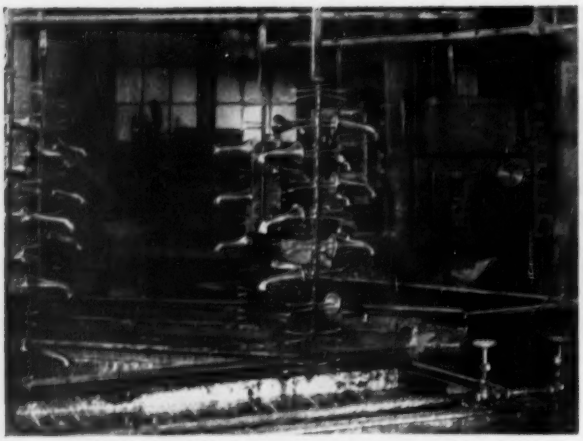
Verson

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • SO. LAMAR AT LEDBETTER DRIVE, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES



Electromax for plating-tank control at Barnes Manufacturing Co. (plumbing fixtures) saves its cost in 6 months in reduced maintenance. Electromax resists humidity & acid mist.

The Sterling China Co. says "Our two Electromaxes do a perfect job at no expense; no maintenance; no attention from supervisors". Electromax resists dust & vibration.

No-maintenance Controller?

WELL, ALMOST . . .

● For years at a time, your instrument maintenance men may never even see the inside of your Electromax Temperature Controllers.

And when they do look into one, they find only five items that could ever need replacing—two 120-volt light bulbs, two ordinary radio tubes and a relay. All five of these expendable elements could be replaced in five minutes.

Fine engineering, however, greatly reduces the chance of even that much maintenance. Design requires the two radio tubes to operate at only 10% of rating. The relay (the only moving part in the whole instrument) is a hermetically-sealed, plug-in type. There's no dry cell, no standard cell, no ink, no chart, nothing to lubricate.

With its small size, low price, excellent accuracy and really remarkable simplicity, you'll find many uses for Electromax, at temperatures to 1000 F. You can get full information from the L&N office nearest you, or from 4957 Stenton Ave., Philadelphia 44, Pa.

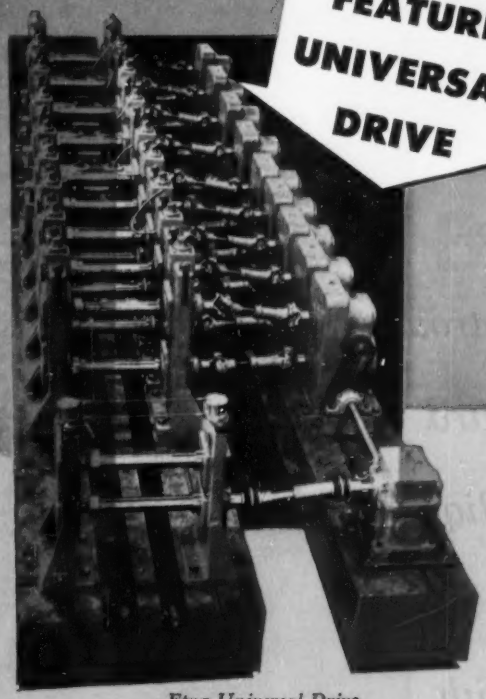
LEEDS NORTHRUP
instruments automatic controls • furnaces

Jrl. Ad ND46(13)

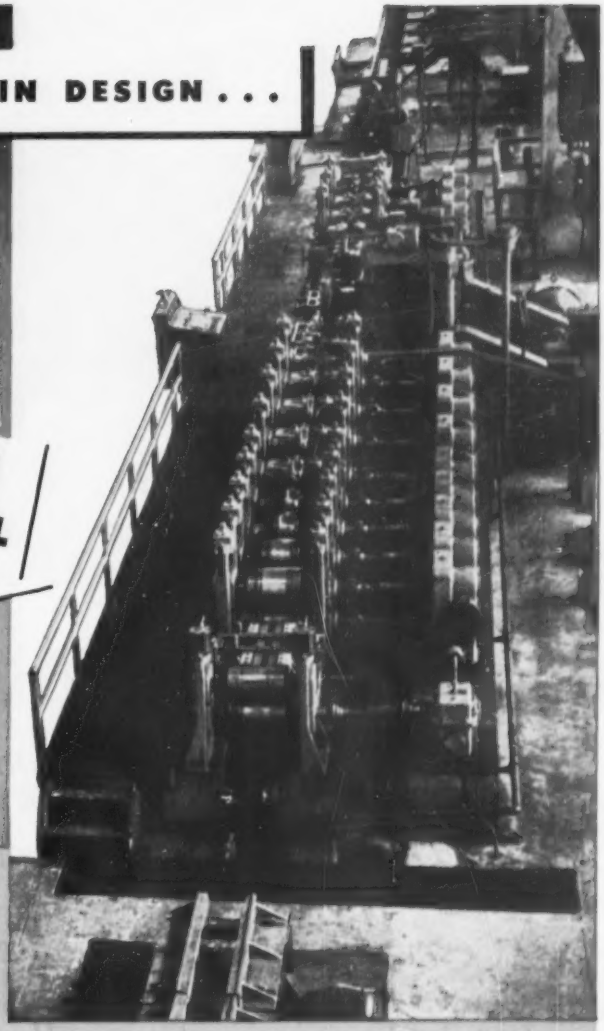
LEADING THE INDUSTRY IN DESIGN . . .

Etna TUBE MILLS

FEATURE UNIVERSAL DRIVE



Etna Universal Drive



You'll notice a trend toward Etna's modern machine design. Etna has sold more Universal Drive Mills than all other manufacturers combined. The Universal Drive provides greater accuracy in the forming of the tube, and allows an easier change from the manufacture of one diameter tube to another.

PERMANENT OIL COOLED TRANSFORMER

For greater efficiency an *Oil Cooled Transformer* is incorporated into the machine. It is a *permanent unit* and *never has to be replaced.* Cooling with oil eliminates the necessity to dry out the transformer after each days work, which is necessary when water is used as a transformer coolant. Etna Mills . . . Built for continuous operation. Write for complete details.

Abbey ETNA Company

3402 MAPLEWOOD AVE., TOLEDO 10, OHIO

Once it gets a foothold, fire rips into your plant like a monstrous claw. That means you must guard every hazard—flammable liquids, electrical equipment as well as ordinary combustibles—with Kidde Portable Extinguishers or Built-in Systems.

Call your Kidde agent today.

Kidde

Walter Kidde & Company, Inc.
160 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

LETTERS
TO THE EDITORS

Cheers for the Yearbook

Please enter our order for 27 copies of STEEL's Metalworking Yearbook issue (Jan. 4).

M. Hogan
U. S. Steel Export Co.
New York

You did this Yearbook issue job up very well.

Francis G. Tatnall
Eddystone Division
Baldwin-Lima-Hamilton Corp.
Philadelphia

The Yearbook issue was in my humble opinion the best I have seen over the years.

H. G. Walter
president
Gerrard Steel Strapping Co.
Chicago

Compass for Competition

The "Compass for Competition" (Jan. 4, p. 113) is a most interesting and thought-provoking report. In fact, we think so highly of it that we would like to get 20 copies for distribution to our sales personnel.

Earl E. Cook
Threadwell Tap & Die Co.
Greenfield, Mass.

Your "Compass for Competition" has been read by all of us here at the Roto-Finish Co. with much enthusiasm. We would like to pass it on to our service organization and wonder if it would be possible for us to obtain 25 copies.

We will be looking forward to receiving your special reports, pointed toward this competitive era. We believe we can keep our business cycle on an even keel if we do not let fear creep in as it did in the late 20's and early 30's.

D. T. Barrett
president
Roto-Finish Co.
Kalamazoo, Mich.

. . . a very excellent article.

W. E. Morgan
Morgan Lumber Sales Co.
Columbus, O.

We would like to have 75 copies of "Compass for Competition."

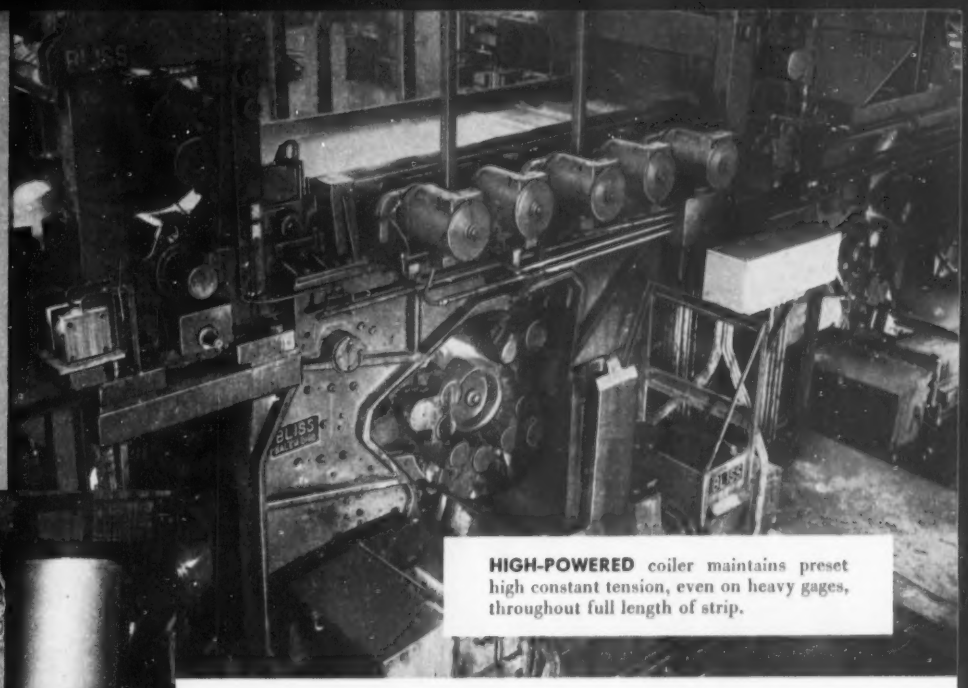
T. E. Pickering
manager
Advertising & Sales Promotion
Firth Sterling Inc.
Pittsburgh

• *Sent. Reprints of "Compass for Competition" still are available in limited quantities.—ED.*

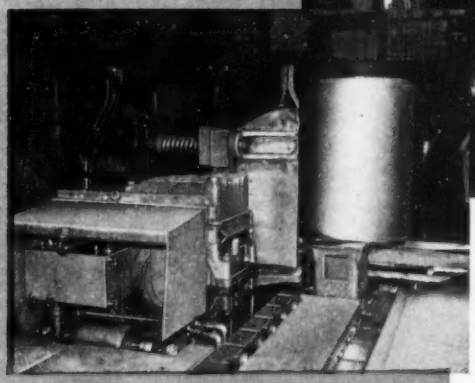
Termination Made Easier

It was with considerable interest that the undersigned read your article "9 Ways to Faster Contract Termination" (Nov. 9, p. 80). The information contained therein will no doubt be of considerable assistance to representatives of industry. It is a pleasure to read arti-

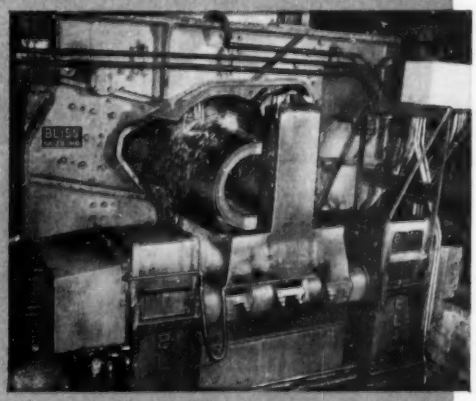
Please turn to p. 12



HIGH-POWERED coiler maintains preset high constant tension, even on heavy gages, throughout full length of strip.



TIGHTLY-WOUND, uniformly-coiled strip, protected from surface and edge damage results from this unit.



QUICK EJECTION and downending are facilitated by special mechanism. Rapid unloading cycle eliminates terminal bottleneck.

BLISS hot strip coiler at Ford promotes QUALITY CONTROL

For high speed coiling and all-around efficiency in "rolling up" hot band off the Hot Strip Mill, Bliss mandrel-type hot mill coilers have demonstrated their ability in major steel plants. Latest of these installations is this 66" coiler at Ford's River Rouge plant.

Due largely to the features of the Bliss mandrel, desired coil and metal characteristics are achieved to a degree previously unattainable; e.g., by coiling the strip steel on an arbor with high constant tension applied, *coils are more tightly and uniformly wound.* Thus, *surfaces and edges are better protected, and better metallurgical characteristics are realized.* And after coiling, the reliable collapsing feature of the mandrel greatly facilitates the stripping of the coil.

Designed for versatility of application, too, the Bliss coiler accommodates a range of speeds, strip widths, and gages. And it's a high-speed coiler capable of handling the largest coils.

If you are interested in modern material handling equipment for steel plants, it's wise to consult Bliss. Meanwhile, write for your free copy of our new 60-page brochure. Ask for Bulletin 40-A.

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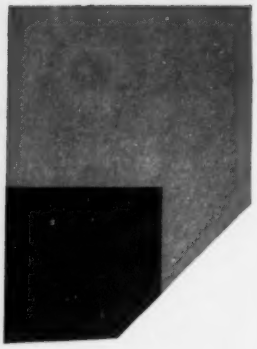

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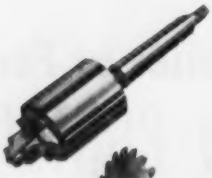

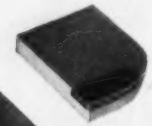

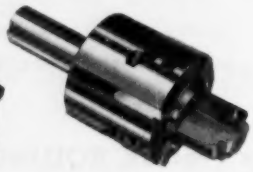

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He begins with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and required finishes and tolerances. He plots speeds, feeds and methods of tool driving. Then he develops practical design and metallurgical specifications for a special tool that's "tailor-made" for your application. And his recommendations are backed by Gorham's more than thirty years' experience in the design, manufacture and heat treatment of fine cutting tools.

Yes, your nearby Gorham Field Engineer is a helpful man to have around! If you haven't yet met him, write for his name, or send details of your problem direct, and we'll have him get in touch with you promptly.

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LETTERS

Concluded from p. 10

cles of this nature which assist the government as well as members of industry.

With the thought in mind that this article may have been overlooked by representatives of some of the smaller plants having government contracts, permission is requested to reproduce the article and distribute the same among contractors having Air Force contracts. This wide coverage will no doubt be of great assistance to the Air Force in settling claims arising from contract terminations.

Frank E. Hoffman
Colonel, USAF
chief, Cleveland Air Procurement District
Cleveland

• *Permission granted.—ED.*

Handbook Hits the Mark

STEEL's Specifications Handbook is excellent. Just what we have been looking for, for years. We are grateful that you went to the trouble and expense of having it compiled.

Richard H. Dawe
Bridesburg Foundry Co.
Fullerton, Pa.

French Communique

In the Nov. 30 issue, p. 65, you spoke of a new French organization which combines the various steel works of the department of Loire. That information is correct. But, you add that formation of this organization is "counter to ECSC theory of breaking cartels into small units," and "in Germany agitation continues for a reconcentration of the German steel industry to match that going on in France."

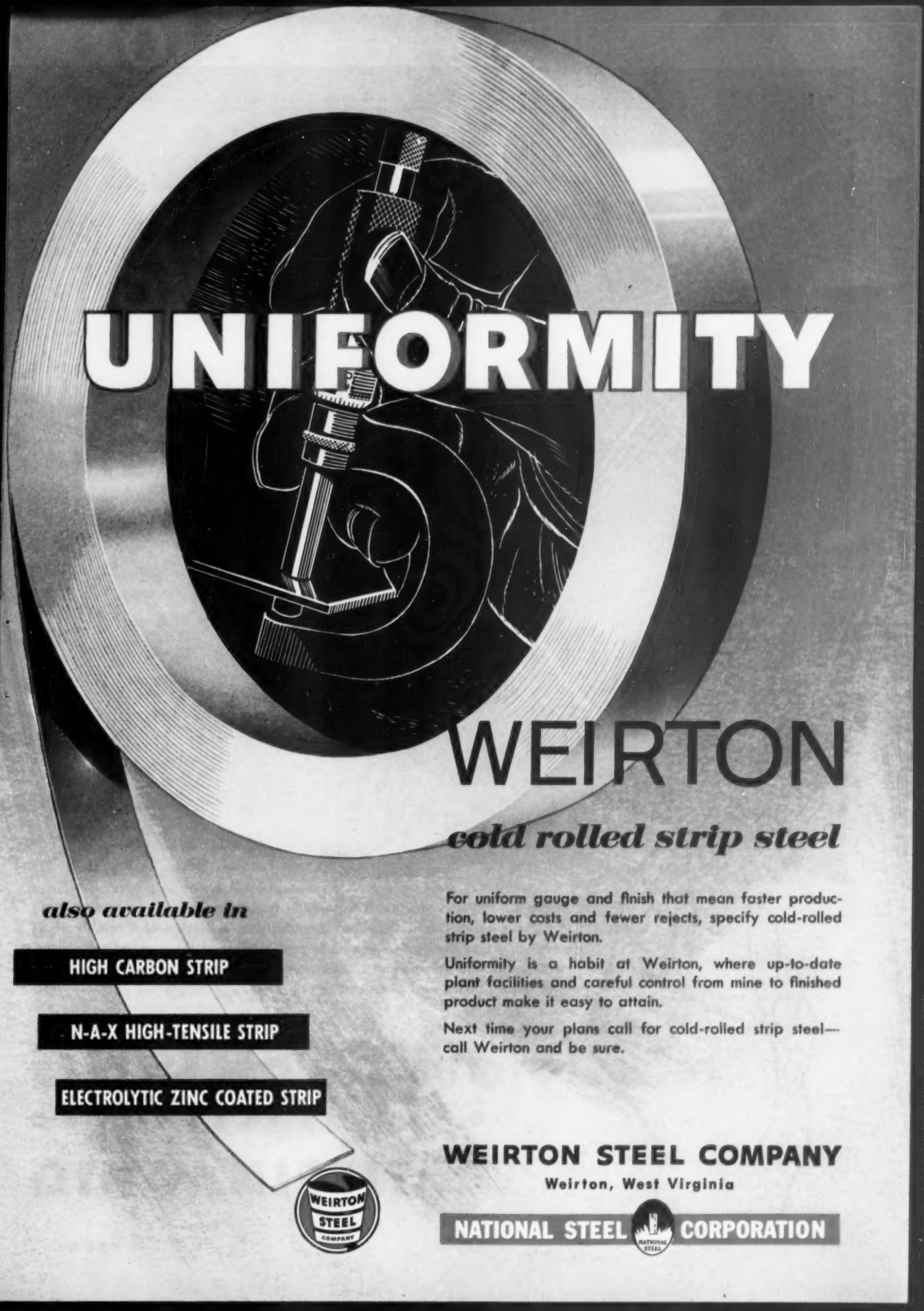
This, I believe, is a misinterpretation of the facts.

After World War II, the western allies promulgated Law Number 27, according to which the large combines of Germany, such as Vereinigte Stahlwerke and Krupp, must be broken up. That law is still in force.

In France there were no such large combines, only small or medium-sized plants. For them, ECSC (European Coal & Steel Community) recommended grouping together and specialization for the smaller ones in order to reduce costs, particularly in the department of Loire, where there were many tiny and very old works. Though old fashioned, they still produce very good crucible and tool steels.

The Societe des Ateliers et Forges de la Loire, the organization about which you wrote, is still a small producer, with a capacity of 150,000 to 200,000 tons of steel a year. You can easily see that it is not a "cartel" and that it will not endanger the life of the ECSC but rather will help in its development.

L. Jaudoin
Paris, France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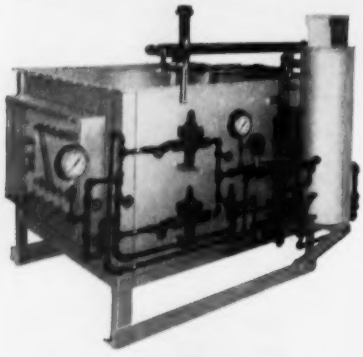

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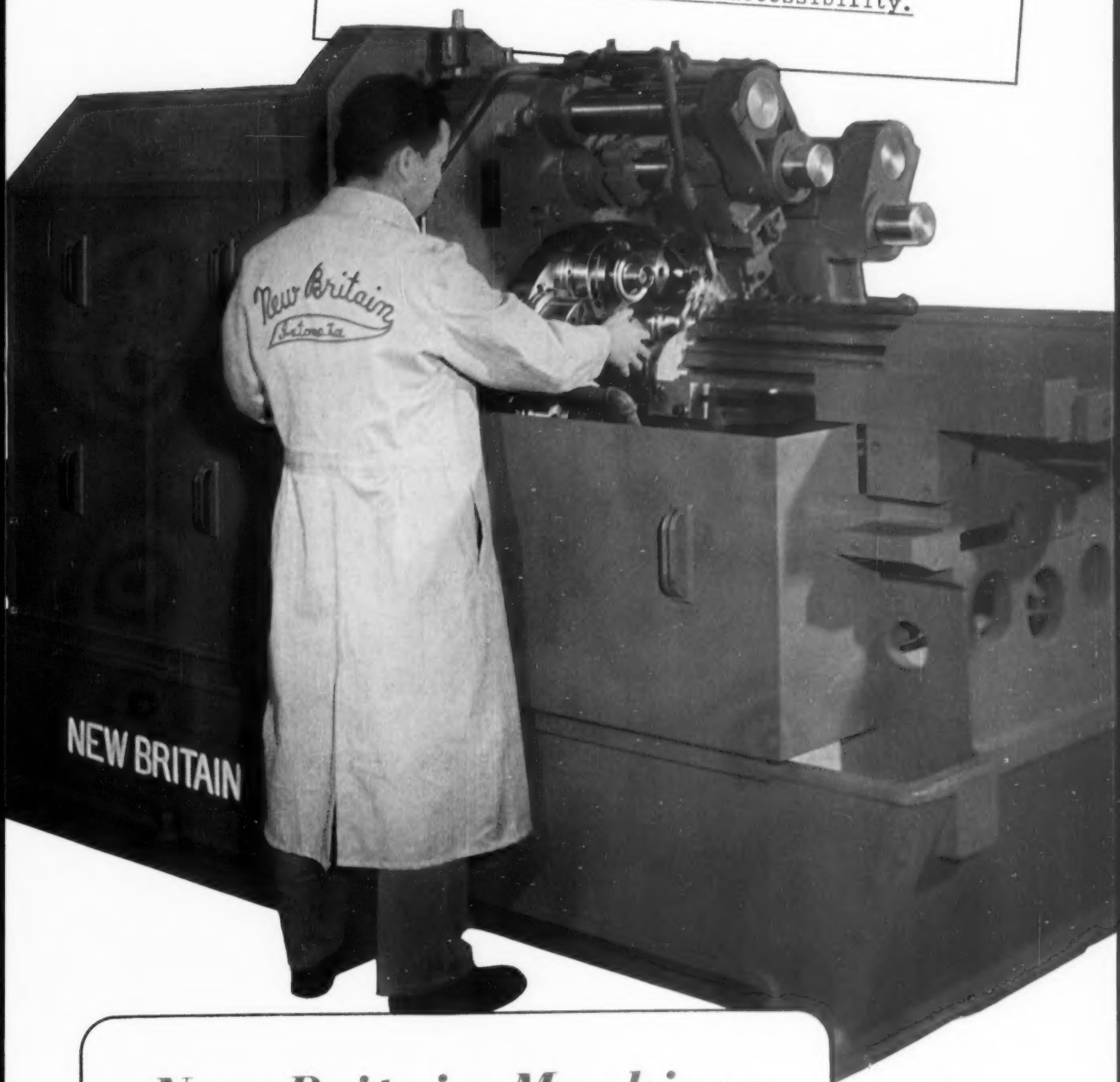

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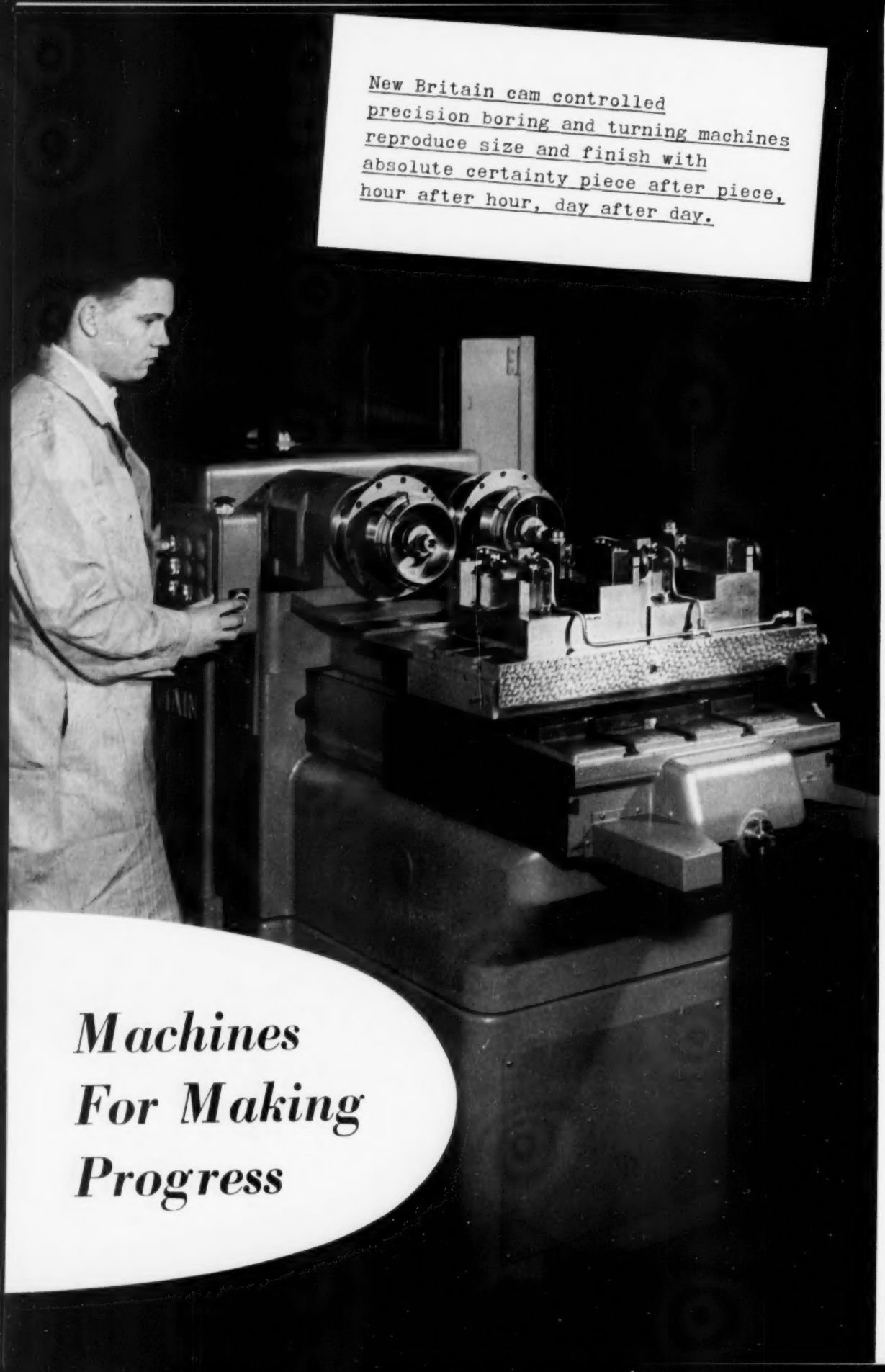
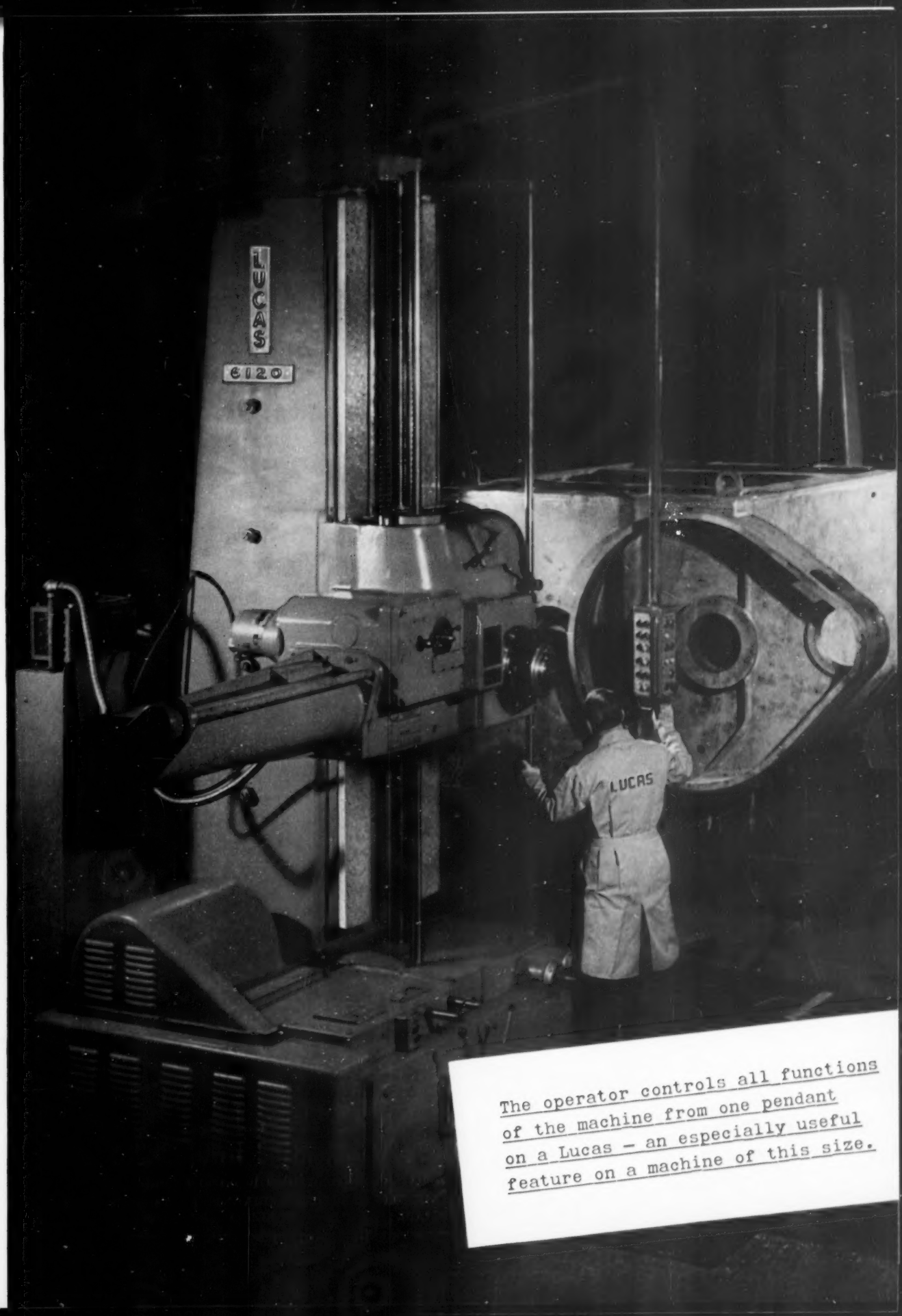

New Britain cam controlled precision boring and turning machines reproduce size and finish with absolute certainty piece after piece, hour after hour, day after day.
Machines For Making Progress



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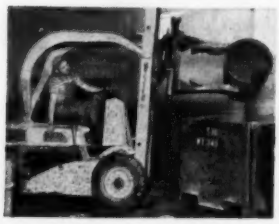
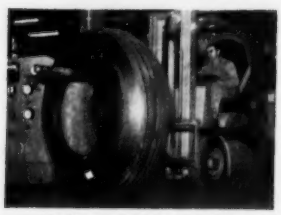


REVOLVING LOAD-GRAB

SCOOP, FOR LOOSE MATERIALS

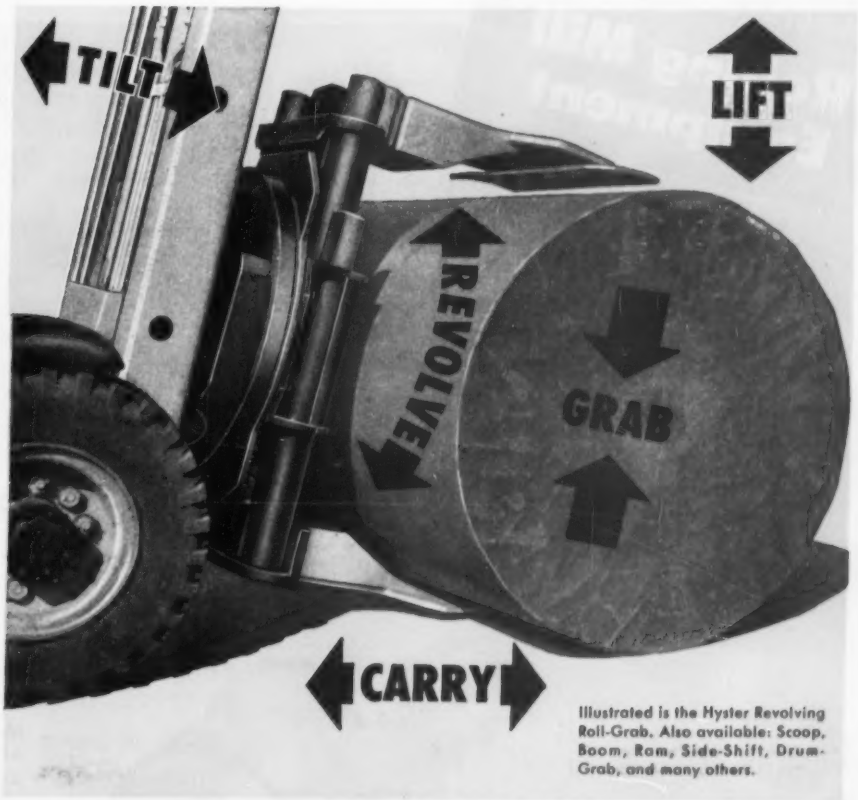
PULPWOOD BOOM



RAM, FOR ROLL SHAPES

LOAD-GRAB FOR CRATES, BOXES

BOOM, AS MOBILE CRANE



Illustrated is the Hyster Revolving Roll-Grab. Also available: Scoop, Boom, Ram, Side-Shift, Drum-Grab, and many others.

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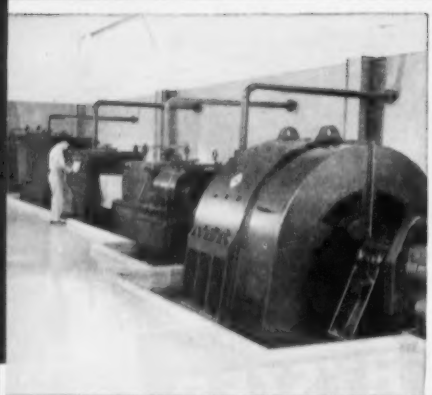
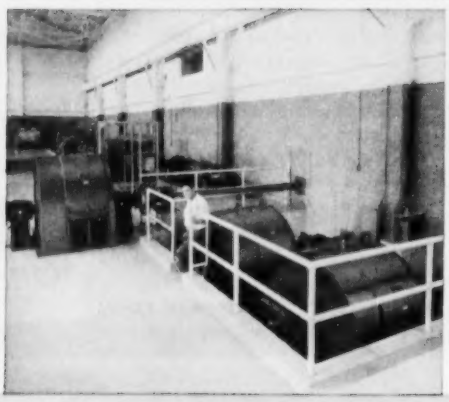
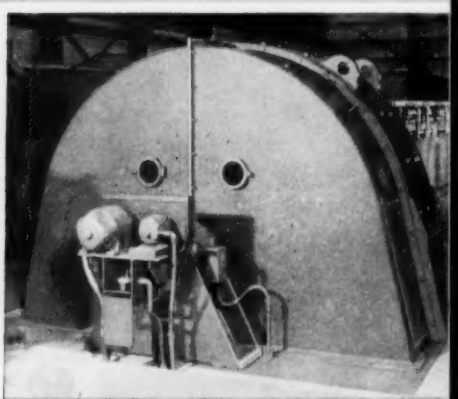


Roughing stand drives in the motor room. The 400-hp, 300/900-rpm dc motor in the background drives stands 1 and 2, and the 1500-hp, 300/750-rpm dc motor in the foreground drives roughing stands 3 through 8.



Intermediate stand drives in motor room. Three of the four 800-hp, 300/900-rpm dc motors driving stands 9 through 16. Larger rods are taken directly from these stands without passing through the finishing stands.



Finishing stand drive in the mill proper. This Allis-Chalmers 2000-hp, 300/600-rpm dc motor drives stands 17 through 22. Any number of these six stands may be used to run a variety of small rod sizes.

NEW ROD MILL

at Kokomo, Indiana

AN IMPORTANT PART of Continental Steel Corporation's expansion program to satisfy growing demands for their wire products is the specially designed Allis-Chalmers equipment controlling and driving the 22 stands in this all-new continuous rod mill.

Allis-Chalmers motors and controls are responsible for furnishing the precision speeds required in processing rod from billet to finished product. Each stand must be perfectly coordinated with the others to receive and pass rod from a starting speed equal to a walk and progressing to a finishing speed approximating 60 miles per hour.

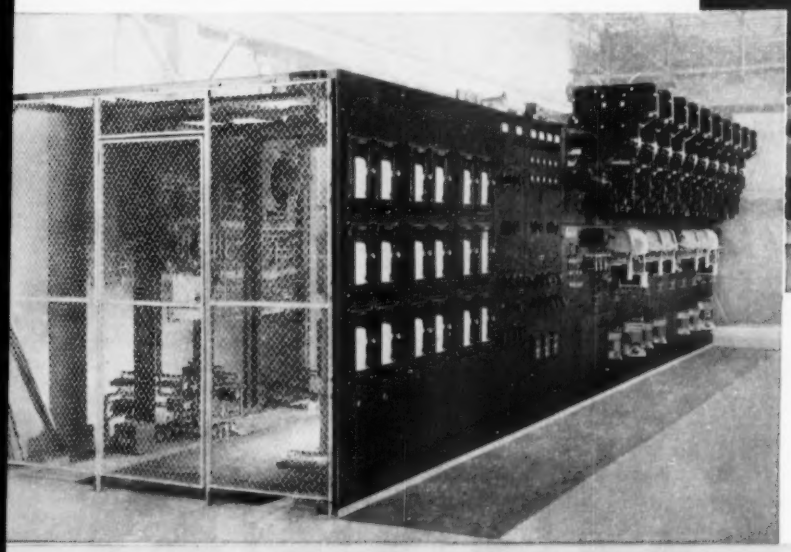
Simplified Control

The seven drive motors are standard rolling mill types, engineered to meet the mill requirements and to operate through a simplified speed control system regulating motor field circuits with individual series exciters. Satisfactory mill operation, running three rods simultaneously, has produced 24 coarse and fine rod sizes from 0.218 to 0.681 inch, with projected use up to 1.125 inches.

This mill system gives Continental the benefits of flexibility and adaptability, with quality control not limited to a particular product size. Simplified control and durability are features Allis-Chalmers engineers have used to assure low maintenance costs.

For specific information on control, drives, and other electrical equipment to meet the needs of your expansion or conversion program, contact A-C office nearest you or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-4151

Regulex is an Allis-Chalmers trademark.



Pulpit control for rod processing. From this vantage point the operator controls stand speeds varying from 38 to 114 feet per minute at the start of roughing, to finishing speeds of 5000 feet per minute.

Variable voltage control panel (left) in the motor room for the main drive motors.

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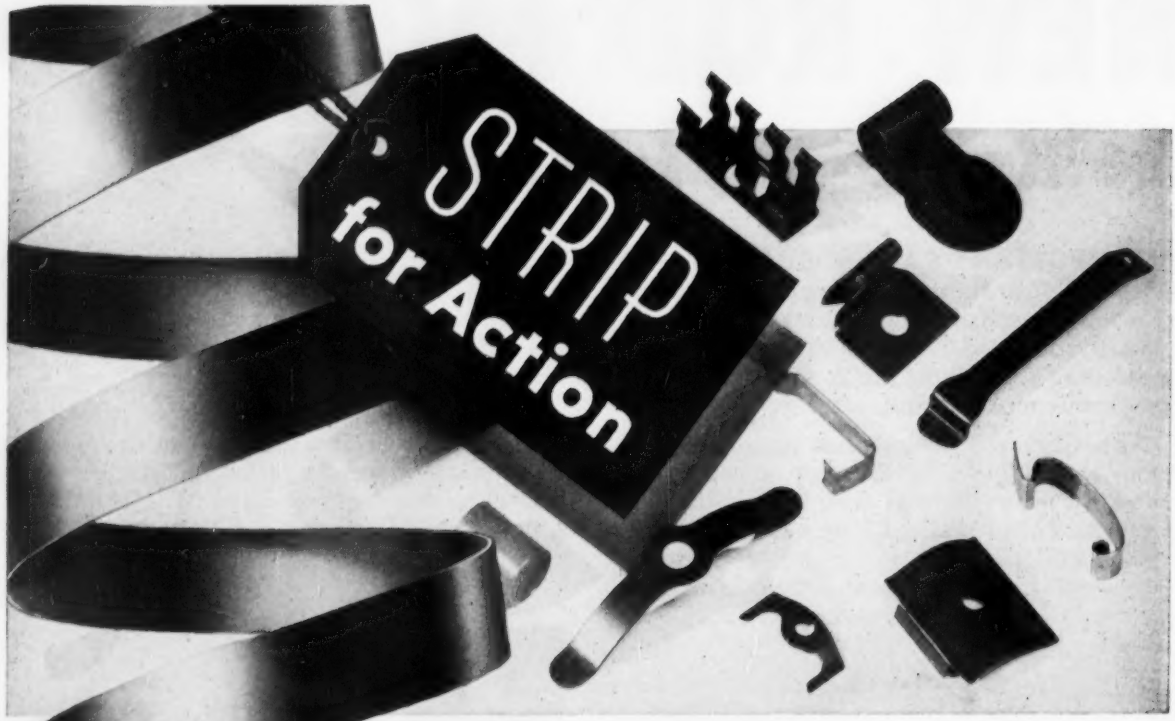
Power, Electrical, Processing Equipment for Iron and Steel



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Cincinnati Press Brakes, with low-cost tooling, simplify difficult sheet metal and plate jobs and are versatile, profitable and busy tools in any fabricating shop.

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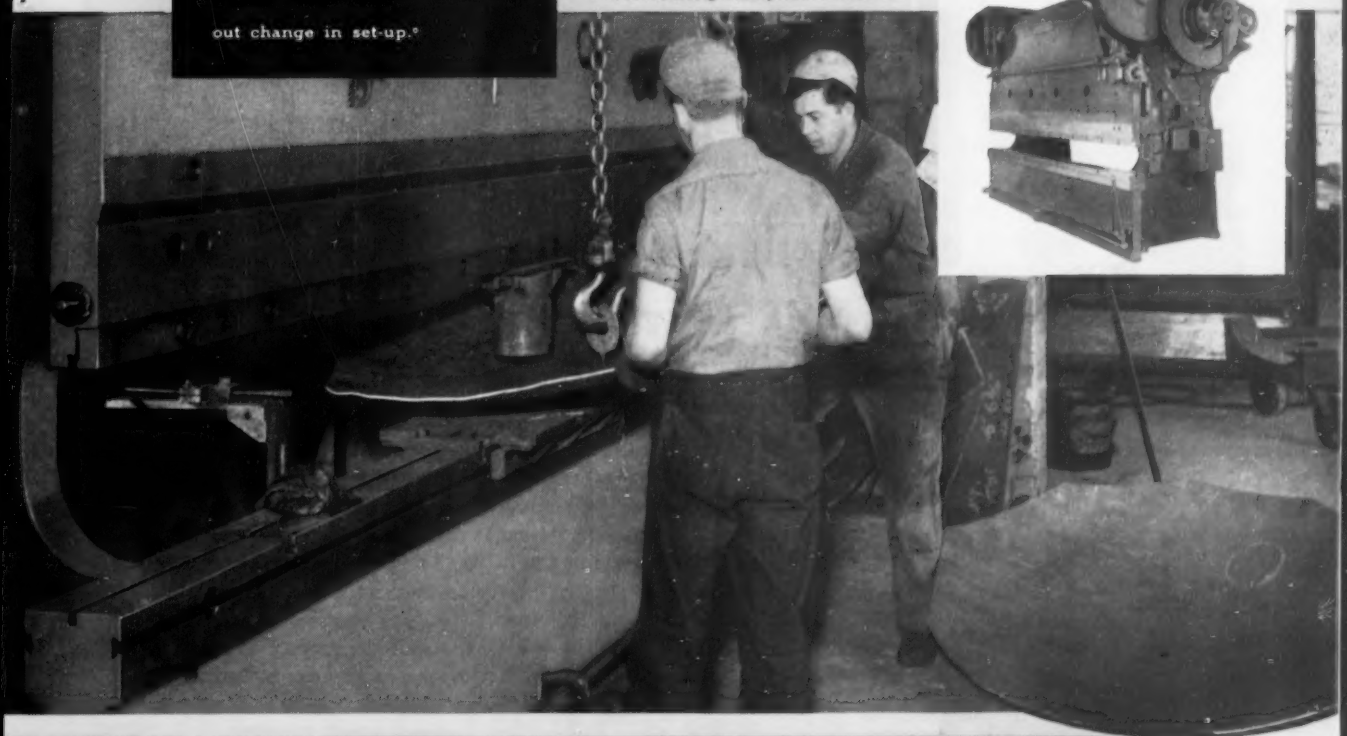
Photos courtesy Bishopric Products Co.



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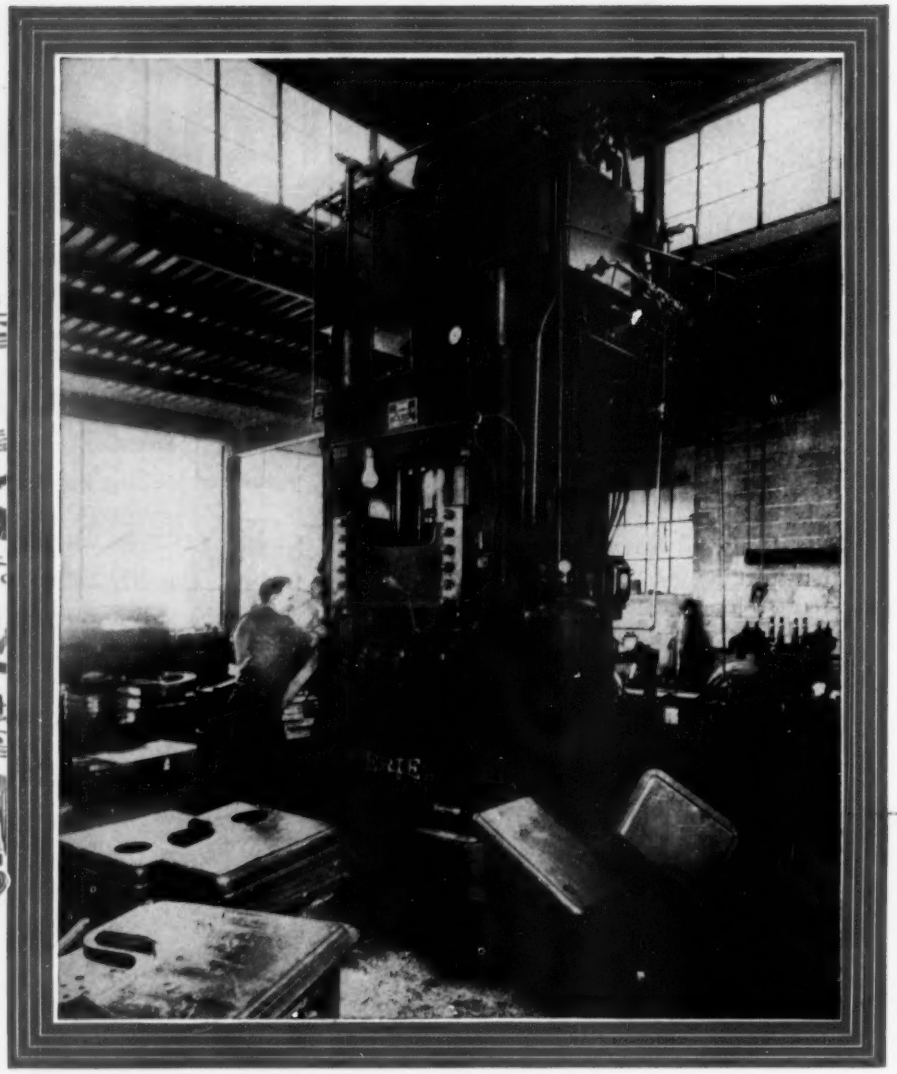

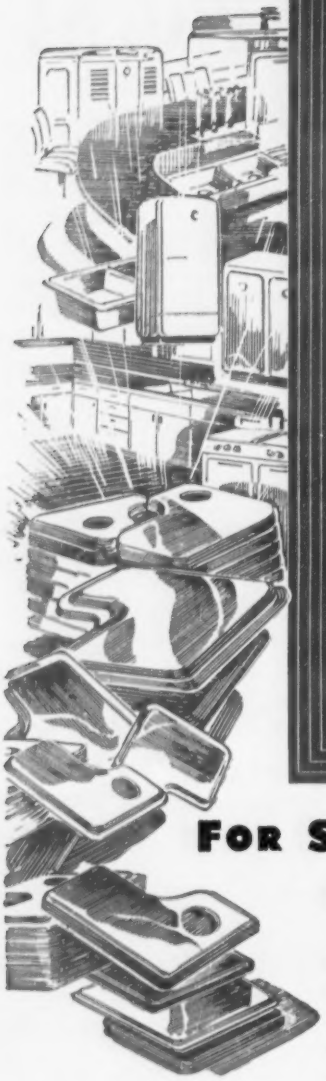

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CALENDAR
OF MEETINGS

January 25-26, Industrial Furnace Manufacturers Association Inc.: Annual meeting, Warwick hotel, Philadelphia. Association address: 412 Fifth St. NW, Washington. Secretary: T. F. Sheckels.

January 25-28, Plant Maintenance & Engineering Conference and Show: Hotel Conrad Hilton and International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 26, Cutting Tool Manufacturers Association: Annual meeting, Lochmoor Club, Detroit. Association address: 416 Penobscot Bldg., Detroit 26. Executive secretary: Martin J. Ewald.

January 26, Mining & Metallurgical Society of America: Annual meeting, Mining Club, New York. Society address: 11 Broadway, New York 4. Secretary: Lt. Col. Donald M. Liddell.

January 27, Aluminum Extruders Council: Meeting for members, Hotel Statler, Cleveland. Council address: 1001 Connecticut Ave. NW, Washington 6. General counsel: Phillip Lemelman.

January 27-29, American Management Association: Marketing conference, Hotel Roosevelt, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

January 29, Cleveland Chamber of Commerce: Northern Ohio personnel and executive conference, Hotel Carter, Cleveland. Information: William G. Donaldson, Cleveland Chamber of Commerce, Union Commerce Bldg., Cleveland.

January 29-30, Annual Industrial Engineering Institute: University of California, Berkeley, Calif. General chairman, Bruce G. McCauley, University of California, College of Engineering, Berkeley 4, Calif.

January 31-February 2, Hydraulic Institute: Annual meeting, Edgewater Beach hotel, Edgewater Beach, Fla. Institute address: 122 E. 42nd St., New York. Secretary: Frank P. Anderson.

January 31-February 4, Associated Equipment Distributors: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 30 E. Cedar St., Chicago 11. Secretary: P. D. Hermann.

February 1-2, Annual Industrial Engineering Institute: University of California, Los Angeles. General chairman, Bruce G. McCauley, University of California, College of Engineering, Berkeley 4, Calif.

February 1-5, American Society for Testing Materials: Spring meeting, Hotel Shoreham, Washington. Society address: 1916 Race St., Philadelphia 3. Executive secretary: Robert J. Painter.

February 3-5, Society of the Plastics Industry Inc.: Annual reinforced plastics division conference, Edgewater Beach hotel, Chicago. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

February 4, Instrument Society of America: Annual regional conference, Hotel Statler, New York. Society address: 1319 Allegheny Ave., Pittsburgh 33. Secretary: P. V. Jones, Jr.

February 5-6, National Association of Cost Accountants: New York regional conference, Hotel Roosevelt, New York. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

February 11-12, Western Computor Conference & Exhibit: Ambassador hotel, Los Angeles. Information: H. G. Weightman, 1405 W. Magnolia Blvd., Burbank, Calif.

February 13-18, Automotive Electric Association: Annual meeting, Edgewater Beach hotel, Chicago. Association address: 802 Michigan Bldg., Detroit. Executive secretary: S. W. Potter.

February 15, American Society of Civil Engineers: Winter meeting, Hotel Biltmore, Atlanta. Society address: 33 W. 39th St., New York. Executive secretary: Col. William N. Carey.

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AN ORGANIZATION

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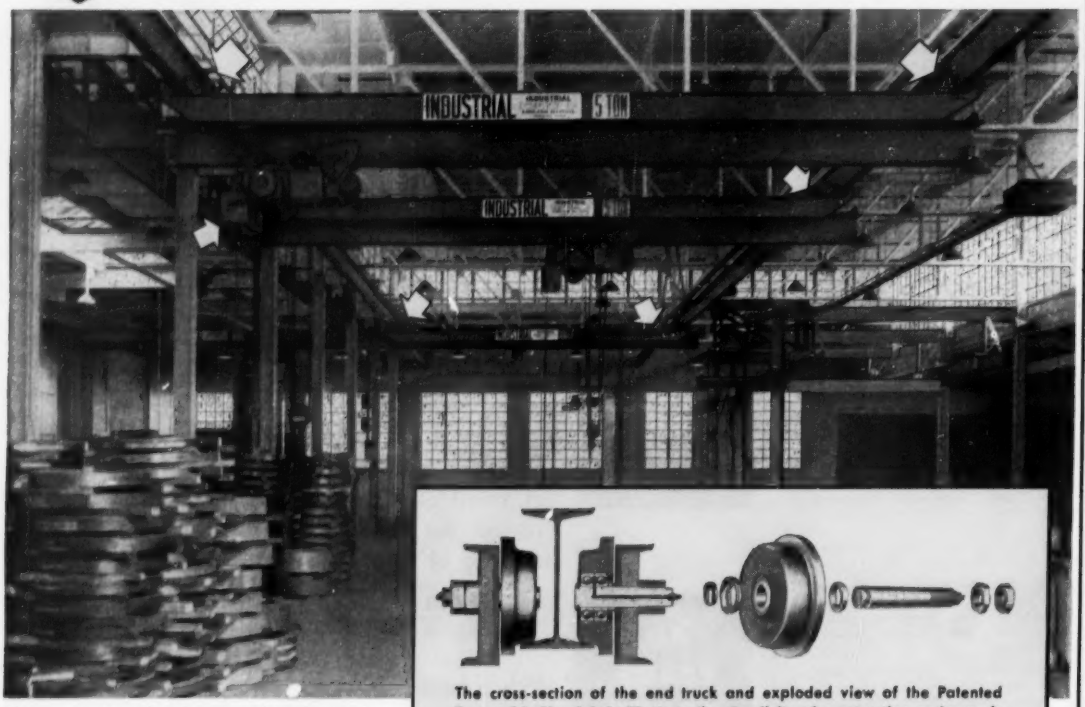
Industrial Underhung CRANES feature Patented Removable Head Axles



The arrows show location of end trucks on the Industrial Underhung Motor Driven Cranes which are equipped with Removable Head Axles.

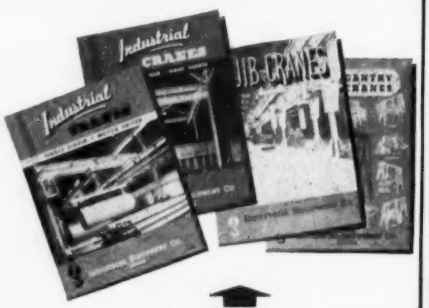
The cross-section of the end truck and exploded view of the Patented Removable Head Axle illustrate the simplicity of construction and reveals how wheel replacement can be accomplished without dismantling Crane or disturbing alignment of end truck.

All Industrial Underhung Cranes are equipped with PATENTED REMOVABLE HEAD AXLES. This feature, with the use of our jig-welded, jig-bored precision end trucks, guarantees perfect alignment of crane upon runway and equal distribution of weight on all crane wheels, which is of vital importance to top crane performance.

Another benefit derived from this feature is the ease of erection of the crane in the field. Our simplified precision construction and removable axles greatly facilitate placement of crane on runway.

All Industrial Underhung Cranes are equipped with FORGED STEEL WHEELS with hardened treads* and because of the patented removable axle, wheels can be easily replaced when worn—to save time and money. Industrial Cranes are designed and built for dependable performance and long life.

Consult Industrial Crane & Hoist Corp. for Cranes to solve your material handling problems.



WRITE FOR CATALOGS

*Forged Steel Wheels are standard equipment, the treads of all drivers being hardened to a depth of 1/8" at Rockwell C.55-60.

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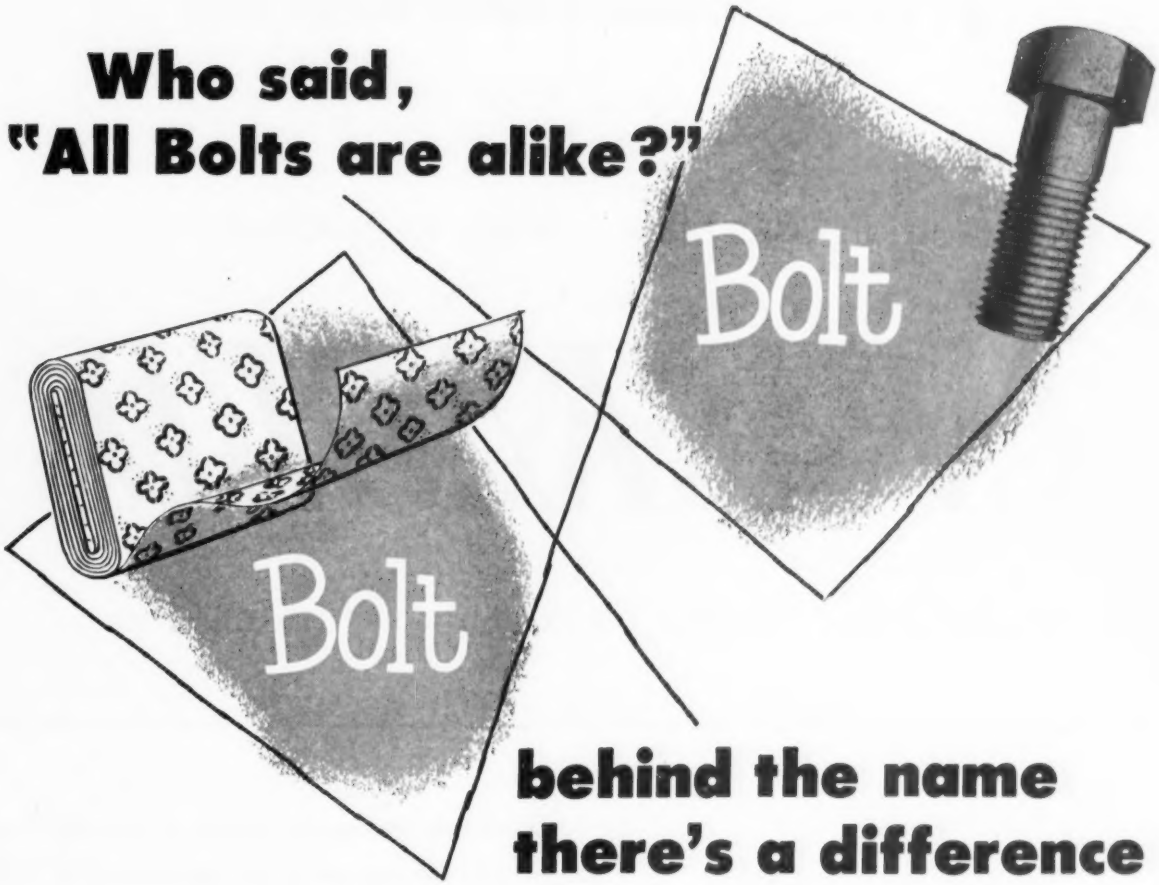
Who said, "All Bolts are alike?"



behind the name there's a difference

You may have heard the statement "all bolts are alike" so it doesn't matter where you buy them.

Technically, and from a "standards" standpoint, they should be alike. So why is it that some bolt companies like Lamson & Sessions prosper and continue to grow?

Well, we like to think it's because of certain intangible ingredients that can't be measured, tested or even, in some cases, identified.

Maybe their salesmen are more personable, more helpful and agreeable. Or perhaps the service is better with an obvious "all out" effort to satisfy the customer.

Whatever it is, we *do* know that we make every effort to keep our customers smiling. We try to make it *easy* and *pleasant* for them to do business with us.

If that's what it takes to make one bolt a better, more attractive buy than another – fine. We think we're on the right track.

That's why we dare say: "All bolts are *not* alike" and we are happy in the thought that our customers share this opinion.

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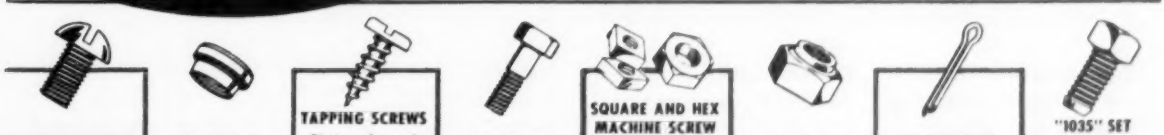

MACHINE SCREWS — Precision made for fast, economical assembly.

PLUG NUTS — Ideal for blind or hard-to-reach places.

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This newly announced service of the Lake Erie Engineering Corporation is not an experiment. It is something we are doing more and more for leading plants throughout industry. It is a natural outgrowth of the ever increasing desire of our customers for our specialized services. As a result, we have the resources...the staff...the experience...to offer you the complete service described at the right. Call us. Then you will fully appreciate the advantages of a central responsible source. You will not be obligated...but you will be pleased.

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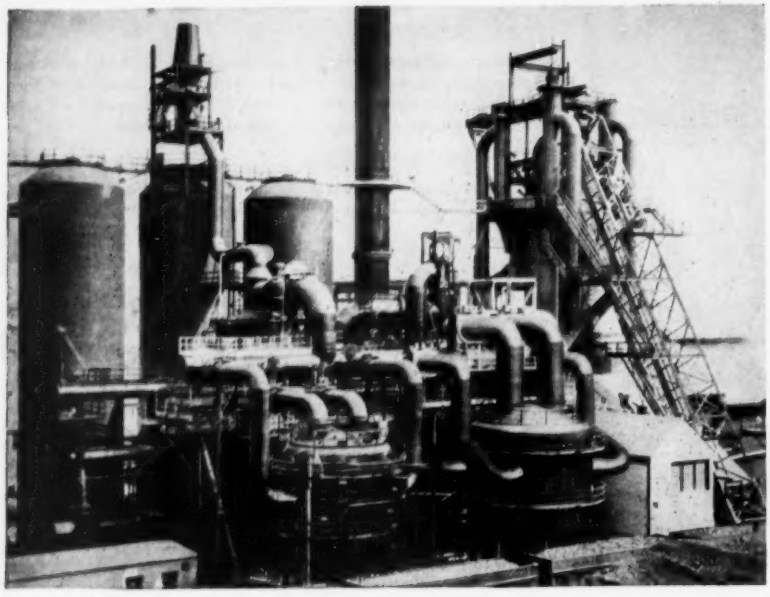


How Cottrell Precipitators Clean Gas in the Steel Industry

Iron Ore Sintering Plants

The first commercial Cottrell installation for cleaning gases coming from the iron ore sintering machines was placed in operation in 1952 with collection efficiencies exceeding 95%. In this installation the gases leaving the windboxes of the sintering machine pass to a flue, then to a mechanical collector, to the induced draft fans, to the precipitator, and then to stack. The gases enter the precipitator at temperatures of about 250 to 300F, with water vapor content of about 8%. The dust collected is dry and quite fine. The precipitators used on this application are of the horizontal steel plate type.

Iron Blast Furnaces

The cleaning plant in most iron blast furnace installations consists of the preliminary stage (dry dust catchers), the primary stage (water scrubbers) and the secondary stage (water-flushed Cottrell Precipitators). Dust and fume content of the gas is reduced to the range of 0.1 to 0.3 grains per cubic foot of gas corrected to standard conditions before it reaches the Electrical Precipitator. The function of the precipitator is to further clean this gas to a final dust content ranging in most cases from 0.005 to 0.01 grains per cubic foot, depending on how the gas is to be used.

Open Hearths

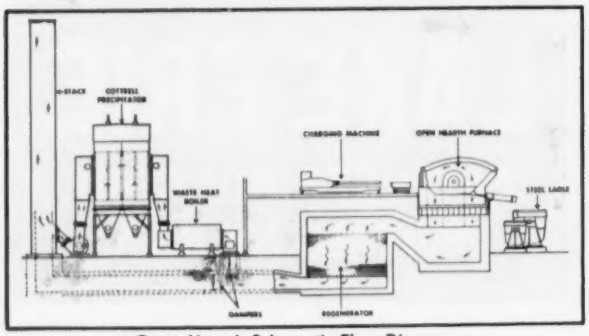
This problem involves the cleaning of combustion gases coming from furnaces, usually oil-fired, and carrying in suspension a heterogeneous mixture of very fine metallic oxides.

After extensive research and pilot plant studies, Research Corporation completed the first commercial precipitator installation for cleaning open hearth gases in 1951. Test results at rating indicated efficiencies of over 95% were obtained. Most of the time there was no visible discharge.

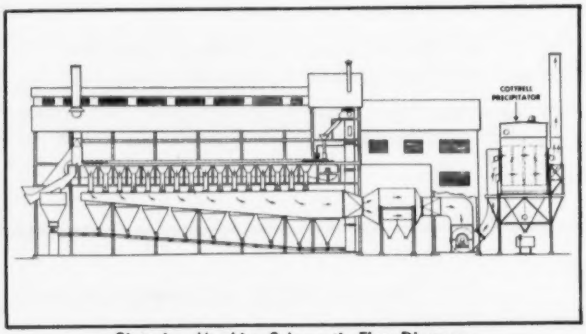
Other Steel Applications

In addition to the above, Research Corporation Cottrell installations are being used for detarring by-product coke oven gas, cleaning oven fuel gas and producer gas, and cleaning ferromanganese blast furnace gas.

Detailed information on all these applications is available through your nearest Research Corporation office.



Open Hearth Schematic Flow Diagram



Sintering Machine Schematic Flow Diagram

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RC145

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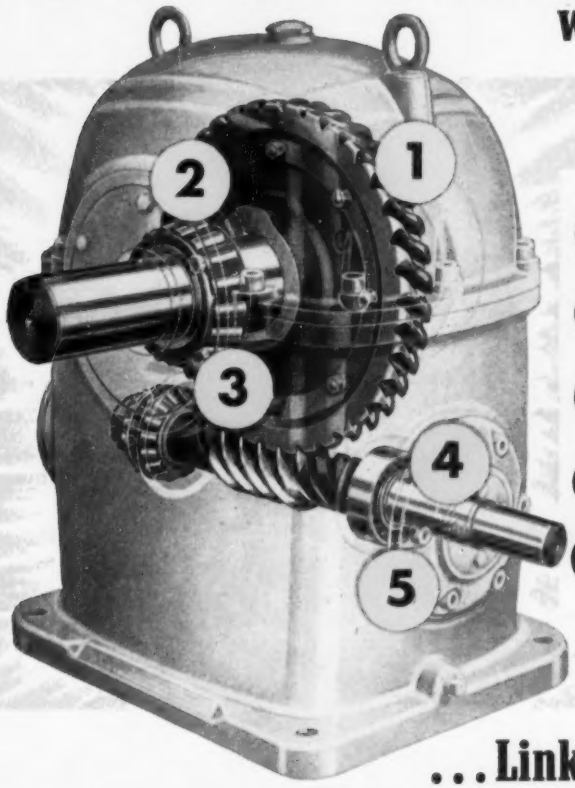

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With their compact, high-strength design, Link-Belt Worm Gear Drives permit high-ratio speed reductions in small space. High input speeds and low output speeds are provided, with ample capacity for heavy loads.

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Link-Belt Worm Gear Drives are available in 3.1:1 to 8000:1 reduction ratios, 1400 to 123,000 in. lbs. torque—0.22 to 564 output shaft rpm. Ask for Book 2324-A.

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WHY PRE-INTEGRATED LINK-BELT DRIVES CUT YOUR POWER TRANSMISSION COSTS

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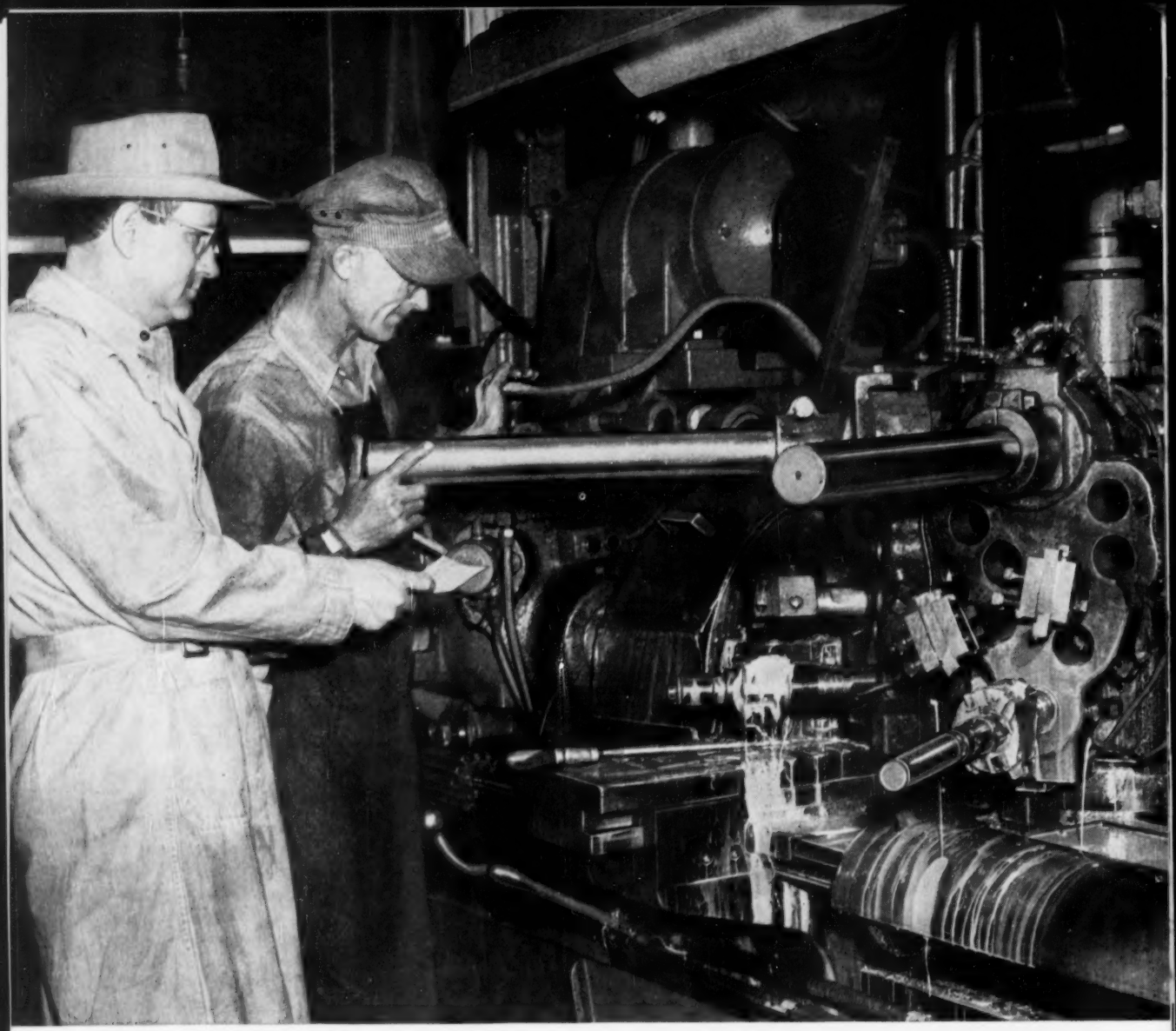

The Four Wheel Drive Auto Co. benefits 4 ways with

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REG. U. S. PAT. OFF.
Soluble Oil

• Over a period of nearly 40 years, the Four Wheel Drive Auto Co., Clintonville, Wisconsin, has used SUPERLA Soluble Oil on an increasing variety of machining jobs. Shown above is a current operation performed on a semi-automatic turret lathe. The job calls for boring and turning of 1040 steel to produce differential case assemblies.

Company officials report that on this job, as on many other jobs employing milling machines, drill presses, and grinding machines, SUPERLA Soluble Oil has provided these four important benefits: **1.** Mixes readily with cold water. **2.** Forms stable emulsions. **3.** Helps hold close clearances and dimensions. **4.** Helps provide good finish and tool life.

The long and successful experience of the Four Wheel Drive Auto Co. with SUPERLA Soluble Oil testifies to the benefits you can obtain with this outstanding coolant.

The Standard Oil lubrication specialist serving your area of the Midwest has a complete line of metalworking fluids and compounds to offer you. He also has the experience and training to help you use these products most effectively. You can reach this man by phoning your local Standard Oil (Ind.) office. Or write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

What's YOUR problem?

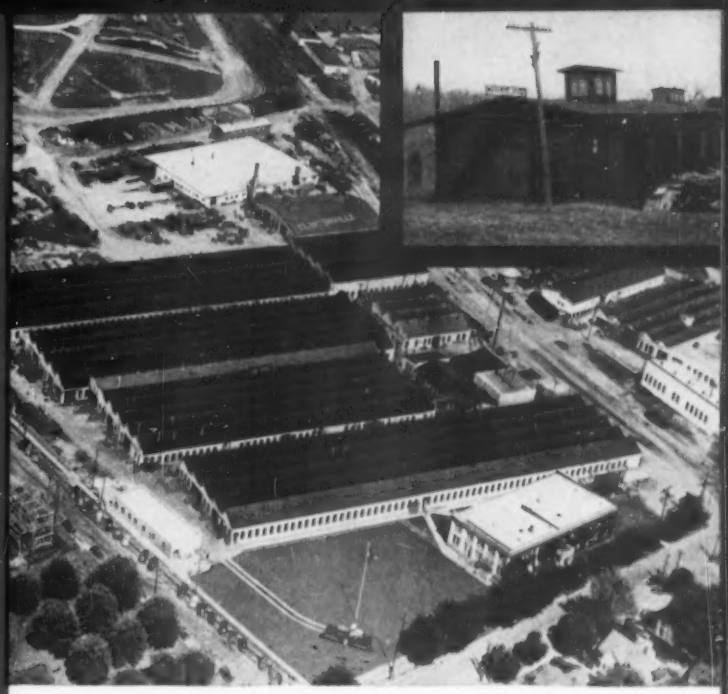
R. E. O'Brien, of Standard Oil's Green Bay office, is the lubrication specialist who works closely with the Four Wheel Drive Auto Co. to assure maximum benefits from the use of SUPERLA Soluble Oil.

He is one of many lubrication specialists who make their headquarters in Standard's offices throughout the Midwest. These men have been specially trained in Standard's Lubrication Engineering Schools and, in addition, have a wealth of on-the-job experience. The specialist nearest your plant is ready to give prompt, expert and thorough attention to your lubrication problems.

A phone call to your local Standard Oil Company office will bring this man quickly to your plant—with no obligation to you, of course.

STANDARD

STANDARD OIL COMPANY
(INDIANA)



Nothing succeeds like service!

These illustrations, contrasting the past with the present, show dramatically the progress made by the Four Wheel Drive Auto Company since its organization in 1910. Service to the nation, through two world wars and in an era of great growth and progress, has won an impressive success for this company. Service, too, has won for Standard Oil an acceptance by the Four Wheel Drive Auto Company that now extends over a period of nearly 40 years.

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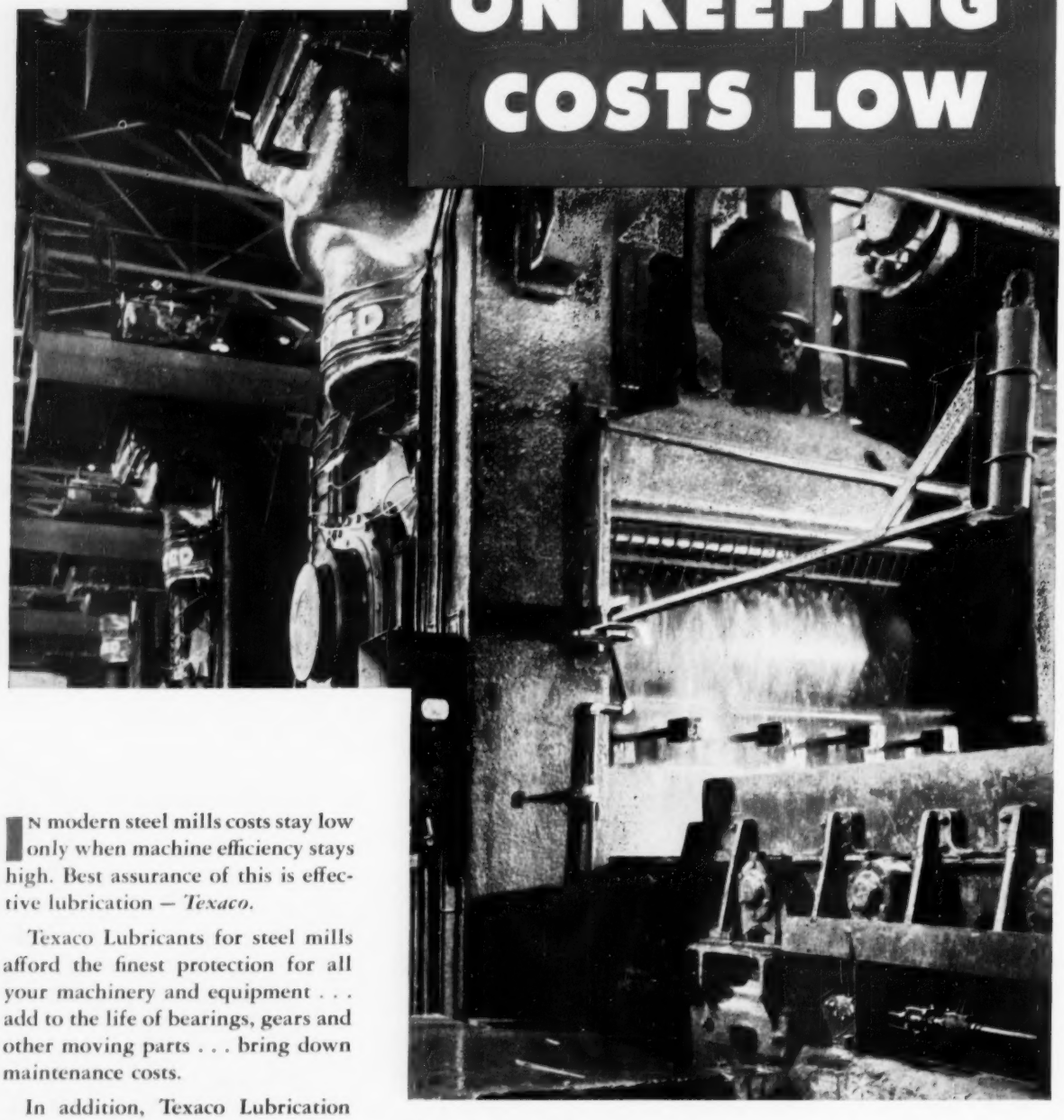

IN modern steel mills costs stay low only when machine efficiency stays high. Best assurance of this is effective lubrication — *Texaco.*

Texaco Lubricants for steel mills afford the finest protection for all your machinery and equipment . . . add to the life of bearings, gears and other moving parts . . . bring down maintenance costs.

In addition, Texaco Lubrication Engineering Service can be of valuable assistance to you. To secure this service, just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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TUNE IN . . . METROPOLITAN OPERA radio broadcasts every Saturday afternoon. See newspaper for time and station.

Program for Prosperity

The President's program for prosperity, more details of which will be given Jan. 28 in the economic message, shapes up this way: Lower federal expenditures, although they'll still be high; lower taxes; tax reform, particularly in depreciation and double taxation of dividends; easier credit and low interest rates; stimulants to home building and ownership; improved old age pensions; larger unemployment insurance checks; a flexible farm support plan; gradual withdrawal of the U.S. from operations which compete with industry; and public works. The last item will come into play strongly only if the economy gets in bad shape. It's in good shape now. Most of the program points are designed to keep it that way.

Federal Impact

The impact on our economy of cash expenditures by the U.S. in calendar 1954 will be slightly less than in 1953—$73.5 billion vs. $76.8 billion. Those figures are higher than budget statistics revealed by Mr. Eisenhower Jan. 21 because of old-age and jobless insurance payments that come from prepaid funds and because of appropriation carry-overs, from previous years, particularly in defense matters. Fiscal 1955 expenditures by the government are estimated at $65.6 billion, compared with fiscal 1954 expenditures of $70.9 billion. Receipts next year will reach $62.7 billion, compared with $67.6 billion in the current year. Corporate taxes are expected to yield $20.3 billion in 1955.

A Lot for Defense

The budget requests $44.9 billion for security in fiscal 1955, but actual spending will be above that, at least for July-December, 1954. That's because of carry-overs which are boosting defense spending to some $1 billion a week currently. Defense expenditures are climbing for aircraft and guided missiles, but declining for ordnance items like vehicles and ammunition. In calendar 1953, for example, artillery ammunition output amounted to 87 million rounds. It will drop substantially below that in 1954.

New Progress Payment Plan

Look for a more liberal policy by the Defense department in making progress payments. A tighter procedure announced last Sept. 15 raised such a storm that the House Small Business Committee pressed for clarification. Assistant Secretary of Defense C. S. Thomas assures it that clarification is coming.

Three Million Jobless?

Unemployment now probably exceeds 2 million, may pass 3 million for short periods this year. The layoffs are concentrated in durable goods in-

dustries and in those services that cater to metalworking, such as railroads. In the week ended Jan. 9, 467,500 workers filed initial unemployment benefit claims, the largest weekly figure since August, 1945.

Despite Unemployment

Despite the rising unemployment, the search for skilled help continues. A glance at the want-ads in metropolitan dailies proves that. Even in an area, New England, that's supposed to be particularly hard hit, the scramble for high-grade workers is unabated. Companies with New England plants, such as United Aircraft Corp., Billings & Spencer Co., Underwood Corp. and others, all have vacancies.

Optimistic Business Note

Home building is unexpectedly good. Although housing starts in 1953 declined almost steadily from the peak in April, the rate of decline in the closing months of the year was less than seasonal. Housing starts in 1953 totaled 1,102,400, compared with 1,127,000 for 1952 and 1,396,000 in 1950, the all-time peak. Prospect for 1954: About 1 million starts.

Needed: Transport Policy

The White House and many congressmen would like to formulate a national transportation policy. The Commerce department's undersecretary for transportation, Robert B. Murray Jr., is studying recommendations. His goal: Minimum of government participation, private ownership and operation of basic facilities, proper balance between federal and state duties and encouragement of private initiative in transport development. Speeding federal action may be Ohio's move to deny immunity from its new axle-mile tax law to out-of-state trucks. Six states have already retaliated by applying their taxes to Ohio trucks. Ten more say they will follow suit Mar. 1.

Straws in the Wind

Republic Steel Corp.'s $56.7-million income in 1953 was its second best in history . . . Steel drum business will do well this quarter, and small package and lined container volume should be good all year, predicted delegates to the Steel Shipping Container Institute meeting in New York last week . . . The *U.S.S. Nautilus* was launched Jan. 21; it's the first ship to be powered by an atomic engine, built by Westinghouse Electric Corp. . . . With the Senate's approval last week of the St. Lawrence Seaway, the project now has a good chance of House acceptance . . . Perrin G. March III is returning to Cincinnati Shaper Co., Cincinnati; Ralph Cross of Cross Co., Detroit, takes over his duties as head of the Metalworking Equipment Division of Business & Defense Services Administration.

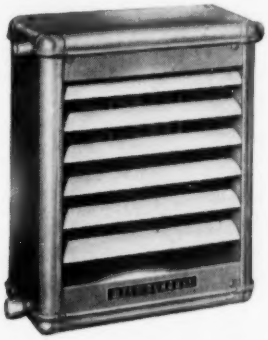
This Week in Metalworking

Machine tool builders are turning a sharper sales policy (p. 47) . . . Seven of 11 heavy presses are scheduled to be in operation by the end of 1954 (p. 49) . . . Small appliance makers see a good year in 1954 (p. 50) . . . General Motors Corp. will spend at least $1 billion on expansion in the next two years (p. 51) . . . Scrap dealers seek a cure to market doldrums (p. 52) . . . Defense department will try pantry-buying to cut costs (p. 53).

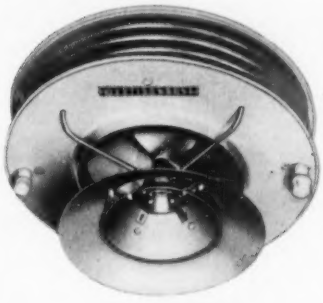
Spot Heating? Complete System?

GET ALL 7 UNIT HEATING ECONOMIES

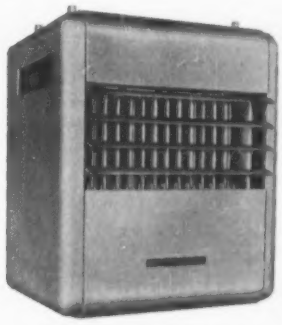
WITH Westinghouse SPEEDHEATERS®



HORIZONTAL SPEEDHEATER
Get 7 to 8 times the output of conventional radiators. 11 standard sizes available for steam or hot water. Capacities from 17,800 to 300,500 BTUH.



DOWNBLAST SPEEDHEATER
(with Multiple Cone Diffuser)
Delivers heat into working areas. 12 standard sizes for steam or hot water. Capacities from 25,000 to 400,000 BTUH.



GAS-FIRED SPEEDHEATER
Will run on low-cost natural, manufactured or LP gas. 7 standard sizes with capacities from 25,000 to 200,000 BTUH. Units have seal of approval of AGA Testing Laboratory.

TO ANSWER ANY UNIT HEATING PROBLEM, ONLY THE COMPLETE WESTINGHOUSE LINE GIVES YOU ALL THESE DOLLAR-SAVING ADVANTAGES:

1. **Instant, Low-Cost Heat**—where and when you want it without long, costly warm-up periods.
2. **Easy Installation**—all models equipped for simple hanger mounting. Minimum piping gives quick fit in tight spots.
3. **Any Application**—wide range of heating capacities—comfort or process—for spot heat or complete systems.
4. **Dependability**—heavy gauge, welded steel construction gives years of service under the toughest conditions.
5. **Design Efficiency**—adjustable louvres direct heat to working area, provide flexible heat distribution pattern.
6. **Quiet Operation**—efficient fan design gives top performance at low sound level.
7. **Dependable Westinghouse Motors**—Replacement motors available on exchange basis from Westinghouse stocking points across the country.

For full details on the Speedheater model best suited to your needs, call your nearest Westinghouse office for Catalogs 1521 (Steam and Hot Water) and 1525 (Gas-Fired), or write Westinghouse Electric Corp., Sturtevant Division, Boston 36, Mass.

WESTINGHOUSE SPEEDHEATERS

YOU CAN BE SURE...IF IT'S Westinghouse

I-80342

How Armco 17-7 PH Solved This Valve-Disc Problem

Four years ago Armco 17-7 PH Stainless Steel was first tried in a manufacturer's check valves. It met all requirements and continues today as the best metal for his valve discs.

Difficulties with Standard Stainless Types

Non-hardenable chromium-nickel stainless steels formerly used often proved too soft—sometimes had to be nitrided. The standard hardenable stainless steels like Types 410 and 420 presented the problems of excessive hardness, cracking and distortion either before or after grinding.

Precipitation-Hardening Solved the Problem

Armco 17-7 PH, in soft condition, blanks and forms readily into these valve discs. The double low-temperature heat treatment then develops the hardness desired without distortion. To attain a hardness of Rockwell C-41 minimum, Armco 17-7 PH is held at 1400 F for 1½ hours, cooled to 60 F, then heated to 950 F for ½ hour and cooled. This treatment produces a 0.2% offset yield strength of 165,000 psi minimum in tension or compression.

Sheets, Strip, Plates and Bars

Armco 17-7 PH is produced in soft condition for double heat treatment in sheets, strip, plates and bars. It is supplied cold-worked for single heat treatment at 900 F in sheets, strip and wire. For further information on this precipitation-hardening stainless steel and its companion grade, Armco 17-4 PH, write for our latest bulletin.

ARMCO STEEL CORPORATION
4583 Curtis Street, Middletown, Ohio
Export: The Armco International Corporation

Water Problem Is Urgent

An important recommendation in President Eisenhower's State of the Union message was that the nation take steps to insure an adequate supply of water. Washington estimates that from $9 billion to $12 billion would be required to make the nation's streams reasonably free of pollution and that another $12 billion to $15 billion could be spent in expansion and conservation.

In some quarters this type of activity for water development is regarded as a potential antidepression program second in size only to highway construction. We believe the nation's water problem deserves a much higher rating of priority than that of an antidepression measure. In truth, in many sections of the country the need for giving prompt attention to the water problem is urgent.

It is gratifying to note that industrialists are among the first to recognize this urgency. Charles M. White, president of Republic Steel Corp., emphasizes it in an article in the January issue of *The Clevelander* entitled, "Will Water Shortages Flash the Stop Sign on Industry?" He quotes L. A. Danse of General Motors Corp. as saying that, "Water is our most important raw material." Mr. White points out that industry uses more water than any other commodity. It takes 65,000 gallons to produce a ton of steel, 160 gallons for each pound of aluminum, and 15,000 gallons to build an automobile.

In view of these requirements by industry, no one can regard the situation caused by last summer's droughts with complacency. The Geological Survey reports that between Jan. 1 and Oct. 1 last year, 1031 municipalities were forced to restrict the use of water to all or part of their customers. Last October, 80 per cent of the flow of the Mahoning river in Youngstown was being maintained by releases from upstream reservoirs.

Fortunately, the nation's average 30 inches of rainfall annually is much more than adequate for our needs. Unfortunately, too much of this rainfall is lost through wasteful runoff. Therefore, a major portion of our water problem lies in the field of conservation. From the standpoint of self interest as well as of national interest, industry should do everything it can to relieve the water crisis promptly.

E. L. Shaner

EDITOR-IN-CHIEF

METAL POWDERS GAIN: While fabricators of metal powder parts recognize that powder metallurgy has definite limitations, there are enough applications where it effects marked savings to result in a steadily growing market for it. In fact, metal powders were used at a

rate of 2.5 million pounds a month during 1953 (p. 88) and powder metallurgy now can be rated as a $200-million-a-year industry.

A recent survey indicates that only 7.7 per cent of the manufacturers using metal powder parts make their own. Of the remainder, 89.7 per cent buy them from outside fabricators and 2.6 per cent both buy from outsiders and make their own. More than 100 fabricators are in business today.

About 48 per cent of the plants use iron metal parts, 69 per cent brass or bronze and 13 per cent compositions other than iron, brass or bronze. Some plants use more than one kind of metal powder parts, which accounts for the fact that the foregoing percentages add up to more than 100.

* * *

RETAIL SALES ADD UP: Many old-timers in the steel industry can remember when practically all steel producers were interested chiefly in "big tonnage" sales. The favorite customers in those early days were the railroads, agricultural implement manufacturers, shipbuilders and structural steel fabricators.

Today the most important steel consumer is the automobile industry. At the lowest level of consumption the old "bulk tonnage" customers have given way to a new category of steel consumers consisting largely of manufacturers of household appliances. We wonder whether the steel producers are missing a bet in not catering enough to the people who purchase these appliances. The aluminum companies (p. 58) are doing a marvelous job of convincing the public of the merits of their product. Possibly steelmakers would benefit by attempting to increase sales by increments of pounds instead of by tons.

* * *

COMPARE STEEL COSTS: At a recent regional technical meeting of the American Iron & Steel Institute in Philadelphia, L. F. Reinartz, vice president, and H. C. Barnes, consulting engineer, Armco Steel Corp., presented interesting comparisons of the cost of ingots per net ton produced in open hearths and electric furnaces in steelworks having capacities of 250,000 and 500,000 net tons, respectively.

From carefully compiled figures (p. 96) the authors conclude that there is a definite place for nonintegrated electric furnace shops under certain conditions. Where cheap pig iron is available, the open-hearth shop in an integrated setup has a definite advantage. On the other hand, when cheap scrap is available, the nonintegrated electric furnace shop has considerable advantage over the open hearth.

On the whole, the conclusions of this able study are encouraging to steelmakers who hope constantly that there always will be an opportunity to go into the business of making steel without having to build blast furnaces, coke ovens and open hearths.

* * *

ACCENT ON AUTOMATION: "How far will machine tool automation go in the next five years?" This is the provocative question in the first paragraph of a timely discussion entitled, "Automation Eyes the Future" (p. 92) by Ralph E. Cross, executive vice president of the Cross Co., Detroit. Incidentally, he explains that the word "automation" was coined a few years ago to mean the automatic handling of parts between progressive production processes. Therefore, he says, the application of automation starts with elimination of work handling.

In view of this explanation, it is not surprising that automation bobs up in the business and technical press with increasing regularity. In this issue alone, in addition to the Cross article, there are an account of recent developments in electronic computers (p. 114), a roundup of automation techniques incorporated in grinding machines developed by the Norton Co. (p. 48) and several lesser references.

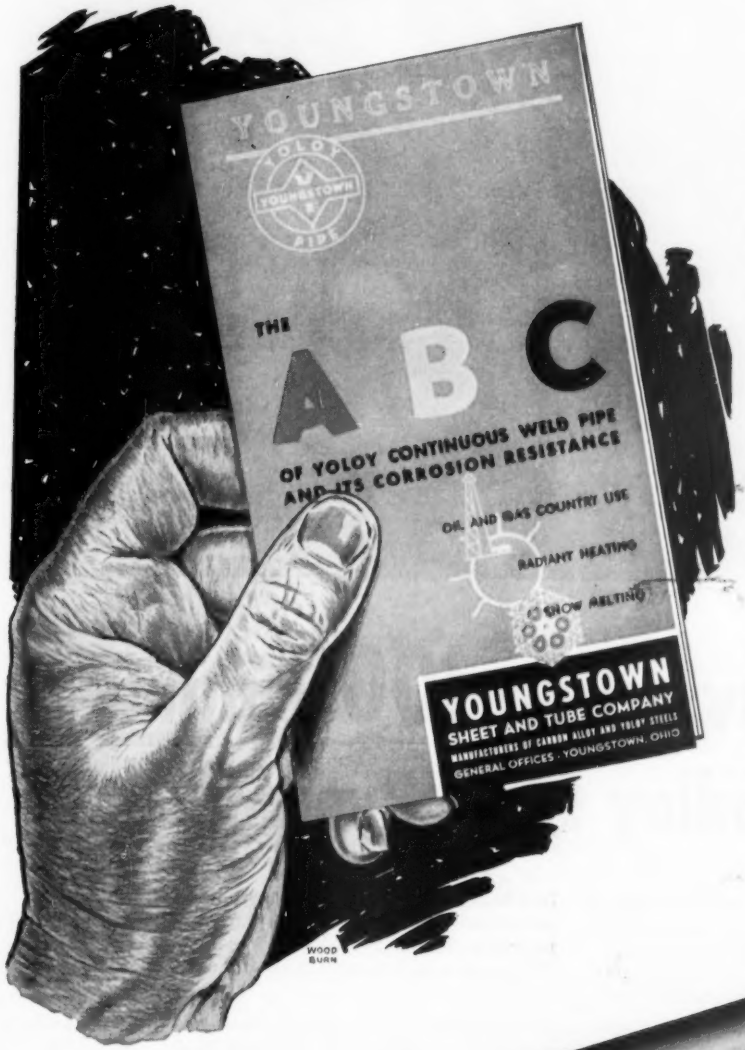
* * *

DISCOUNT DIRE RUMORS: We are in a touchy situation wherein favorable or unfavorable developments can easily be magnified into a significance far exceeding their real importance. Unfortunately there are persons who for political reasons would like to see our country go into an economic tailspin. The Kremlin openly predicts that this is our doom.

Keeping in mind these dire predictions, we should be exceedingly careful in appraising plus and minus factors during the next few weeks. Unemployment has been rising rapidly. At the same time, new investments in modern plant and equipment have been more substantial than had been expected.

Up to this time there is no evidence that we are in for a severe economic recession. We must make certain adjustments, but in the case of most companies this has been anticipated far in advance of actual needs.

This DATA may solve YOUR piping problem



● Here is the up-to-date story of Yoloy Continuous Weld Pipe—a remarkable low alloy steel whose nickel-copper content gives it unique ability to withstand corrosion, abrasion and shock. These outstanding advantages combined with high strength, ductility and weldability make Yoloy Pipe an excellent selection.

Proved by 18 years of satisfactory performance, Yoloy is highly recommended by users in such service as radiant heating, snow melting, gas line gathering, brine lines and other industrial piping.

This new folder presents the facts and figures on Yoloy's physical and chemical properties, with data on sizes now available and other information you'll need to select Yoloy Continuous Weld Pipe to meet your special requirements. Write for a copy today.

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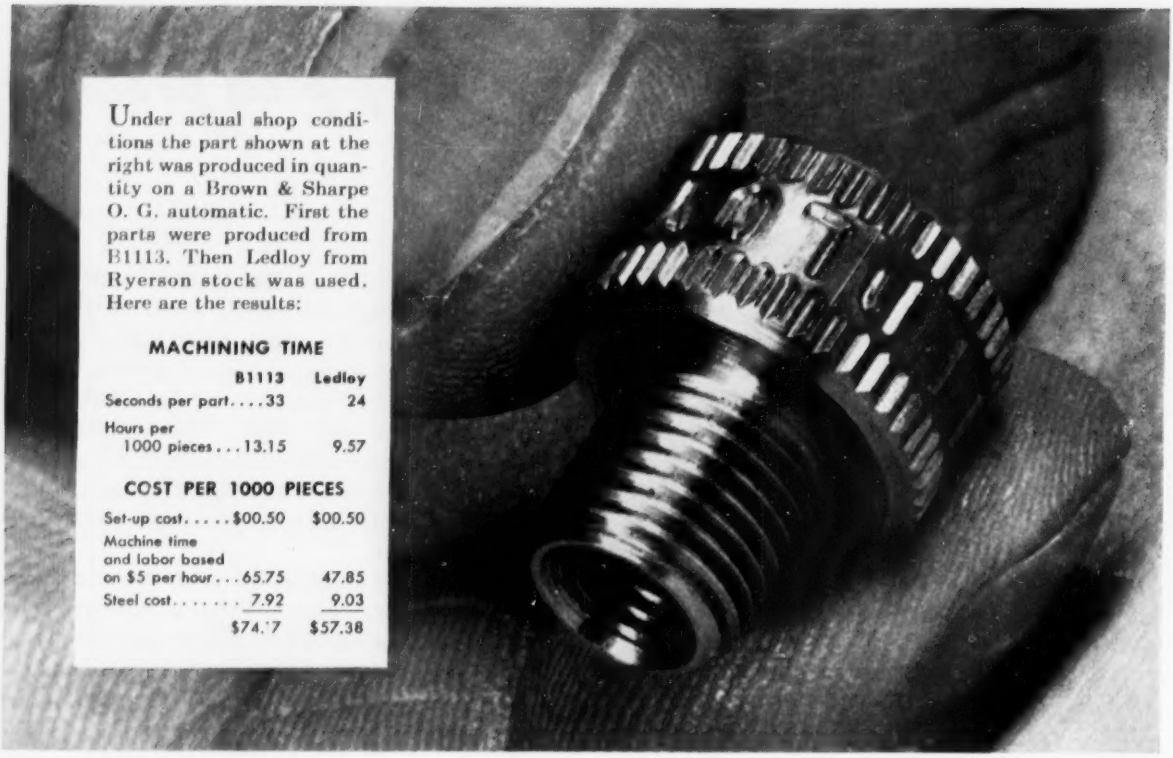

Under actual shop conditions the part shown at the right was produced in quantity on a Brown & Sharpe O. G. automatic. First the parts were produced from B1113. Then Ledloy from Ryerson stock was used. Here are the results:

MACHINING TIME

	B1113	Ledloy
Seconds per part	.33	24
Hours per 1000 pieces	13.15	9.57

COST PER 1000 PIECES

Set-up cost	$00.50	$00.50
Machine time and labor based on $5 per hour	65.75	47.85
Steel cost	7.92	9.03
	$74.17	$57.38

$16.79 saving on 1000 parts using Ledloy from Ryerson

In shops throughout the country Ledloy is effecting similar savings—establishing its superiority over all other free-machining steels. Since switching to Ledloy, one shop reports an increase in production of 54%; another 43%; still another 75%!

On the average, this remarkable lead-lubricated steel brings net savings of 25% or more everywhere it is used by permitting much faster feeds and speeds (25 to 50% faster than B1113) and by extending tool life as much as 200%. Still Ledloy retains the strength and other good qualities of an open hearth steel. Machines to an unusually clean, smooth finish—bends, crimps, swedges or rivets easily.

You can get quick shipment of Ledloy in any quantity from your nearby Ryerson plant. Rounds, squares and hexagons are immediately available in a wide range of sizes. And your Ryerson representative will be glad to give you all the engineering data on this remarkable free-machining steel. We suggest you order a trial quantity now.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished
ALLOYS—Hot rolled, cold finished, heat treated
STRUCTURALS—Channels, angles, beams, etc.
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
PLATES—Many types including Inland 4-Way Safety Plate
REINFORCING—Bars & Accessories, spirals, wire mesh
SHEETS—Hot & cold rolled, many types & coatings
BABBITT—Five types, also Ryertex plastic bearings
TUBING—Seamless & welded, mechanical & boiler tubes
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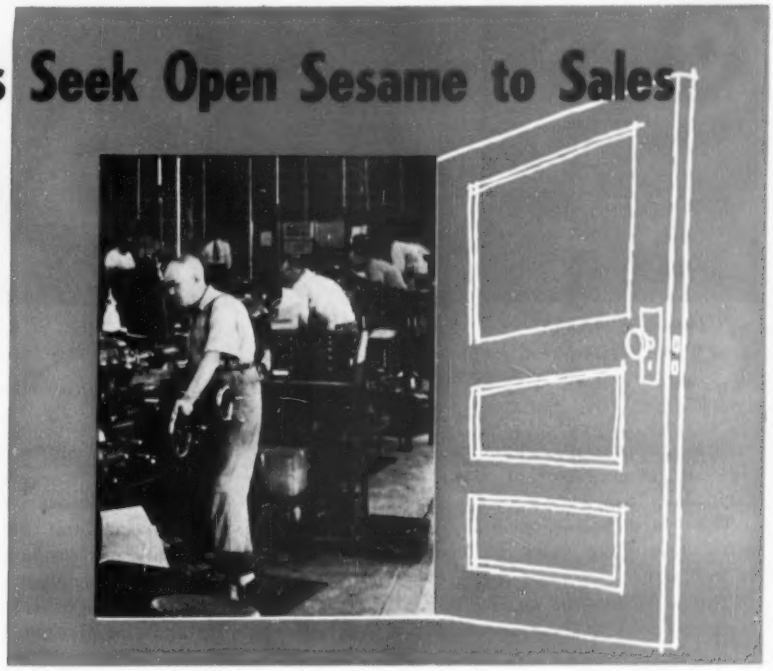
Tool Builders Seek Open Sesame to Sales



They're revitalizing their merchandising by:

Harder selling

More marketing research

New models, new lines

More leasing

THE MACHINE TOOL industry is turning a sharper sales policy.

The order backlog is about 6 months now, compared to about 10 months a year ago. And the new orders index has declined steadily since last summer. Builders are far from panicky, just thoughtful, as they strive to keep their 1954 volume comparable to the near-record sales of $1.2 billion in 1953. Here's what they're doing:

Harder Selling — National Acme Co., Cleveland, will emphasize the rebuilding of customers' machines which took the operational beating of two wars. Officials say, too, that they have a competitive pitch up their sleeves which will be ready in a few months.

Cincinnati Lathe & Tool Co., Cincinnati, has a specially designed mobile theater unit touring the nation with 3-D movies to emphasize machinery replacement.

Cincinnati Milling Machine Co., Cincinnati, has sales and advertising executives currently visiting sales districts giving illustrated lectures to salesmen on the same theme.

Motch & Merryweather Machinery Co., Cleveland, is still emphasizing its sales trainee program.

More Marketing Research — To help it study its sales problems and reorganize its efforts, Jones & Lamson Machine Co., Springfield, Vt., is setting up a marketing research department (see the following story). Only an estimated 5 per cent of machine tool companies have formal research setups.

Studies by STEEL indicate that metalworking plans a 12 per cent boost in machining capacity in 1954. Marketing researchers and other machine tool executives can also get a lift from some big individual expansions just announced, such as General Motors Corp.'s $1-billion program (p. 49), Thompson Products Inc.'s $16-million program (p. 75) and General Electric Co.'s $1-million plans for its Carboloy Division (p. 79).

New Lines, New Products—Norton Co., Worcester, Mass., is among the builders emphasizing still another approach, product diversification. It is extending its lines for more automation, one of the machine tool industry's most promising fields (p. 49).

Among distributors, Motch & Merryweather is considering adding an extra line or two during the year to bolster sales volume.

More Leasing—Kearney & Trecker Corp., Milwaukee, is pushing a leasing plan (p. 49). Warner & Swasey Co., Cleveland, has also entered this merchandising area. Several other machine tool builders say they're interested.

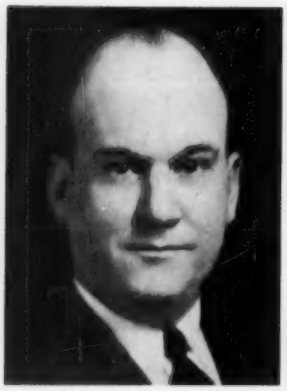
Commerce Secretary Sinclair Weeks is to meet with a machine tool builders committee on Jan. 26 to discuss the industry's problems.

There's no gloom expressed by machine tool builders. As one of them says, "The months ahead will give us a chance to show the stuff we're made of."

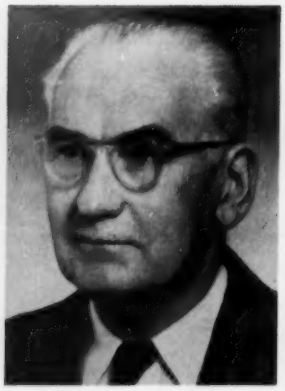
Reorganizing for Sales

RISING TIDE of competition in the machine tool industry is being met with new merchandising techniques by Jones & Lamson Machine Co., Springfield, Vt.

Initial move by the 99-year-old tool builder: Sweeping reorganization of its operating structure. Designed to achieve "decentralization with specialization at the selling level," according to H. L. Andrews, president, the basic changes involve formation of three autonomous operating divisions (machine tool, comparator, thread tool), a



JAMES C. HEBERT
Machine Tool Div.



ROBERT O. BEARDSLEY
Comparator Div.

JOHN E. BARBIER
Thread Tool Div.

HOWARD A. FINCH
Marketing

. . . new managers in Jones & Lamson's reorganization for competitive times

separate marketing division and the post of manager of manufacturing.

The Hard Sell—Jones & Lamson's developing sales philosophy is well written in what it has done in the seven months since Hardage Andrews took over the presidency. The "General Electric look" apparent to the J & L structure shows the influence of Mr. Andrews, formerly executive vice president of GE. Having been in charge of various consumer and capital goods divisions of GE, Mr. Andrews has a full bag of marketing ideas to adapt to machine tools.

"We've made the headquarters move—now we're going down to the field" is the way Mr. Andrews voices his plans. Included in that program is a 30-40 per cent increase in number of field salesmen and strengthening of export sales. A market research and sales analysis department has been set up by the company. (According to recent estimates, only 5 per cent of machine tool companies have market research departments.)

Sales Jackpot—Creation of comparator and thread tool divisions (headed by R. O. Beardsley and J. E. Barbier, respectively) attests their importance in the company's sales picture. Turret and Fay lathes now account for 50 per cent of J & L's sales volume; thread grinders, die heads and optical comparators bring in the balance, according to J. C. Hebert, new manager of the machine tool division. Backlog currently runs four to six months.

Market for comparators has broadened out beyond the confines of machine tool users; customers for die heads are not necessarily normal prospects for machine tool salesmen. By separating product operating divisions, the company will be able to "point a rifle at sales targets instead of a shotgun." Too, when selling five-figure lathes and die heads that cost only a fraction of that amount, a salesman's natural tendency could be to concentrate on the jackpot sale. Sales techniques are also different.

Role of Marketing—In the new Marketing Division, headed by H. A. Finch, company-wide sales policies will be formulated. Here all the sales and promotional functions necessary for successful marketing are concentrated.

Responsibility for all manufacturing and labor policies for the entire company fall under the manufacturing division, headed by R. S. Jones.

New Lines for Markets

AUTOMATION techniques are being applied to close-tolerance finishing operations by Norton Co.'s Machine Division, Worcester, Mass.

Company has developed an automatic crankshaft pin grinder that "with one operator will produce as much as five or seven machines with that number of operators," according to Everett M. Hicks, vice president and general manager.

Tie-in—Two machines have already been sold, one of which is going to Europe. First unit will be completed before the end of the year. It features automatic handling of crankshafts between four grinding stations, automatic trueing and sizing of wheel, and automatic compensation for any wheel wear.

Manual loading and unloading are eliminated in the new pin grinder, as shown by a test unit in the Worcester plant, now completely restored from severe damage inflicted by last year's tornado. Hydraulically controlled overhead handling system takes crank from conveyor or other deposit station to grinder and lowers it for precise automatic location for clamping in potchucks. Need for four grinding stations stems from fact that pins on V-8 crankshafts are each on separate centers offset from shaft-axis. In addition to precise location of crankshaft, care must be exercised in not harming cheeks on side and in grinding uniformly.

Sticklers—As finish grinding is a close-tolerance operation using a more wearable tool than those of turning tools, special problems in applying automation arise, such as automatic compensation for wear and maintenance of wheels inside machine.

Norton's attention to automated equipment is growing. "We're prepared to consider and quote on automation of every grinding job," says R. D. Lawson, sales manager. Some automated equipment by Norton to date: Continuous through-feed lappers, automatic cylindrical grinders, valve grinding machines and an auto piston grinder (not yet sold).

Lease for Profits

"FOR RENT" signs will be hung on new machine tools as builders set their sales effort for the competitive economy.

Kearney & Trecker Corp., Milwaukee, has announced its new tool lease program which offers its entire line of standard machine tools under a rental agreement. Special lease agreements will be considered for special machinery.

Also for Sale—Francis J. Trecker, K & T president, says customers can lease machines under any one of three plans with an option to purchase the machines within limitations of the lease agreement. The entire program supplements company's sales plans.

The program has been tested—experimental leasing arrangement of standard milling machines has been conducted since 1949 with several customers.

Selection — Each of the three plans basically is a seven-year lease agreement. Plan A offers lessee the right to terminate at the end of the third year or anytime thereafter, or to purchase the machine at the end of the third year or anytime thereafter, at a specific per cent of the original list price of the machine.

Plan B offers the same privileges of termination or purchase but at the end of the second year, and plan C does so at the end of the first year.

Rates — Under plan A, rental charges are 25 per cent of the list price for each of the first three years. Plan B follows a 30-25-20-per-cent graduation in rental for the first three years, and plan C, a 35-25-15-per-cent scale. All three plans call for 10-per-cent-per-year rentals during the last four years of the seven-year agreements. Machines on rental are held in the name of the manufacturer, and rentals are paid semiannually in advance.

Machine tool leasing, says Mr. Trecker, allows the customer to expand production without tying up working capital, to stay free from long-term investments, to avoid the risk of high obsolescence and to try out, in effect, new machines without having to buy them.

Coal Over Hill and Dale

Four and one-half miles of rough terrain are covered in one smooth step by this rubber conveyor belt system. Built by B. F. Goodrich Co., the conveyor carries coal for Ohio Power Co.'s new 400,000-kw Muskingum river plant

Progress Without Fanfare

The Air Force's heavy press program has come a long way since cancellations of 1953

HEAVY PRESS PROGRAM of the Air Force is quietly and rapidly approaching the operating stage.

After many vicissitudes and much back tracking, the Air Force figures the program is about 18 months behind schedule. But chances are the bulk of the program, seven out of eleven presses, may be in operation by year end.

Up and Coming—Already in operation on a test basis is a Schloemann Co. 14,000-ton extrusion press, built in Germany and operated by Aluminum Co. of America at Lafayette, Ind., say Washington sources. Being erected is a 35,000-ton forging press, built by Loewy Construction Co. Inc. and to be operated by Wyman-Gordon Co. at North Grafton, Mass. Test operations are expected to start this year with full operations in first quarter, 1955. A 50,000-ton forging press, being built by Loewy for operation by Wyman-Gordon at North Grafton, is expected to be in full operation by then, too.

Parts are practically completed for a 50,000-ton forging press being built by Mesta Machine Co. for operation by Alcoa in Cleveland. Beginning operations of that press are expected by fourth quarter, 1954, and will probably precede first operation of a 35,000-ton forging press being built by United Engineering & Foundry Co. for operation by Alcoa in Cleveland. Schedules call for both of these presses to be in operation by year end.

Also Coming—Lombard Corp.'s 12,000-ton extrusion press to be operated by Harvey Machine Co. at Torrance, Calif., is more than 50 per cent completed. Shipment is scheduled for July or August, 1954, and operation by fourth quarter. Loewy's 12,000-ton extrusion press to be operated by Curtiss-Wright Corp. at Buffalo is scheduled for delivery in the fourth quarter, 1954, also.

Other presses in the program include two 8000-ton extrusion presses being built by Loewy for operation by Kaiser Aluminum & Chemical Corp. at Halethorpe, Md., and one 8000-ton extrusion press being built by Loewy for operation by Harvey Machine Co. at Torrance, Calif. All three of these are now scheduled for delivery in first quarter, 1955. Eleventh press in the program, a 25,000-ton forging press being built by E. W. Bliss Co., will be stored at Kaiser facilities in Newark, O.

Late Change—As part of the late juggling in the program, Reynolds Metals Co. dropped from the ranks of operators. That leaves Alcoa, Curtiss-Wright, Harvey, Kaiser and Wyman-Gordon. Builders of the presses remain Bliss, Loewy, Lombard, Mesta and United.

J. W. Frazer: Autos to Uranium

Joseph W. Frazer, cofounder with Henry J. Kaiser of the Kaiser-Frazer Corp., has severed connections with the successor company, Kaiser Motors Corp., and entered the uranium business.

Mr. Frazer together with a group of New York, Salt Lake City and Houston businessmen has formed and financed the Standard Uranium Co. The firm has purchased an option to buy for $2 million the Big Buck claims in San Juan county, Utah.

Manufacturers' Unit Shipments of Small Appliances . . .

	1952	1953	1954 Trend
Broilers	400,000	1,000,000	up
Cleaners	2,800,000	2,750,000	down
Coffee Makers	3,000,000	3,500,000	up
Fans	2,500,000	3,500,000	even
Food Mixers	1,500,000	1,450,000	even
Fryers	1,500,000	2,500,000	down
Irons	6,000,000	7,000,000	up
Roasters	420,000	450,000	even
Toasters	2,040,000	3,000,000	even
Waffle Irons & Sandwich Grills	850,000	1,000,000	even

Good Small Appliance Salesmen Needed

How they're sold will be the key to 1954 portable appliance sales. Most executives believe their firm will do better in 1954 than in 1953; "other" makes may lose out

IF RIGHT THINKING, hard selling and one or two hot new items will do it, portable appliance manufacturers will have a good year in 1954. Most manufacturers agree industry-wide dollar sales for these housewares may reach a record high of about $715 million retail this year, up 10 per cent from the good year in 1953.

That's only the over-all outlook, however. Sales performances of individual companies and individual products will vary more widely this year than any time in the recent past.

Even More So — Portable appliance sales are traditionally volatile. With any individual product's 1954 outlook depending to a great extent on how well it's sold, sales performances could be even more unstable than usual this year. Trend lines indicated in the chart above show where the appliances listed were headed at the close of 1953.

Steam irons have been going very well and have helped keep irons as one of the leading single dollar producers. Coffee makers percolated along in 1953 and are one of the "hot new items" being readied for the 1954 market by various manufacturers. Rotisseries enjoyed good sales in metropolitan areas. Fryers were a terrific item during most of 1953, but several companies report the fire went out of sales toward the end of the year. Regular flat iron sales were pretty flat and hot plate sales were rather cool. Fans sold very well in 1953, but that's traceable directly to the weather. One company reports its pop-up toaster (selling at $15.95 retail) has been moving very well; another company says

Small Appliance Makers Are Saying . . .

"We are budgeting company-wise for more unit volume in 1954. Last year was a very good one for the industry, and there isn't any reason why 1954 won't be just as good."

S. G. FISCHER, sales manager
Electric Housewares Division
Landers, Frary & Clark Co.

"GE's Small Appliance Division is budgeting its biggest year since it has been in business."

R. E. BOIAN, marketing manager
Small Appliance Division
General Electric Co.

"Westinghouse does predict a substantial increase in portable appliance sales in 1954."

ROBERT M. OLIVER, manager
Portable Appliances, Electric Appliance Division
Westinghouse Electric Corp.

"Our company expects a 10 to 15 per cent increase in sales this year."

R. H. DeWALT, sales manager
Distribution Division, Electric Housewares
Proctor Electric Co.

its nonautomatic toaster hardly warmed up sales at all in 1953.

Minimize the Risk—As a hedge against the unusually choppy business conditions ahead, portable appliance manufacturers are battening down all hatches. Larger companies, such as Dominion Electric Corp., are readying one or two new products to put on the market in case an established line begins slipping. Some smaller companies and one-item firms are consolidating with broader-base firms, such as the Nesco Inc. purchase of Dulane Inc.; or selling out of the business entirely, such as the Eureka Williams Corp. sale of its manufacturing assets to Henney Motor Co.; or trying to diversify their product bases.

A few one-item firms expect to ride out the competitive storm comfortably by concentrating on their one specialty.

Pre-Korea—In their new products, as well as in established lines, manufacturers will go as far as they can back to pre-Korea specifications. Redesign on established lines will be limited, however. Model changes are not made on complete lines of portable appliances each year as is the practice in major appliances and automobiles. The portables are changed one item at a time. Thus, the toaster is remodeled this year, the percolator next year and the iron a year later. Most redesign work this year will be for cost-reduction purposes.

In contrast to the more bullish members of the industry, there's a sizable segment of portable appliance manufacturers who look for a dip in industry sales following the general trend of business. These manufacturers look for a 5 to 10 per cent decline in total sales, probably closer to 5 per cent. Even these manufacturers, however, believe it will be "other" companies which will suffer the loss. For themselves, they believe, the trend will still be up in '54.

Both Alike—Both bulls and bears size-up the consumer this way: There's a lot of money around, though there's also some hesitancy on the part of the consumer to spend it. The salesman will have to intensify his efforts to overcome that hesitancy; the one who thinks it can be done is going to do it.

Chairman Sloan, President Curtice express confidence in '54 as . . .

GM Launches $1-Billion Expansion

CHIDING the "prophet of doubt," General Motors Corp. President Harlow H. Curtice announces that GM is putting $1 billion on the "needs of an expanding market." GM's auto-production capacity is expected to be boosted about 20 per cent by the program.

Sixty per cent of the new capital expenditure program will be accomplished during 1954 and the remainder by the fall of 1955, Mr. Curtice estimates. The bulk of the expenditures will be for expansion of the existing five auto divisions, roughly in proportion to percentage of corporation output. Initial plans for the expansion are already under way; they are in addition to the $2 billion spent by GM from 1946 through 1953 and the record $350 million spent for 1954 model tooling.

Bigger Slice—Mr. Curtice forecasts that GM sales in 1954 will not be far from the record level attained in 1953, exceeding $9 billion by a "substantial amount." As to the GM share of output in 1954, he says, "It will satisfy me as long as it is in excess of 48 per cent." GM makes accounted for 46 per cent of the industry total in 1953. With a forecast of auto and truck production totaling about 6.3 million this year, he observed that the increase "will not come from a greater market."

The GM president expressed confidence that 1954 will be another good year for business generally. He predicts a gross national product equal to this year's estimated record of $365 billion.

GAW Factors—The answer to the guaranteed annual wage hinges upon three specific questions, Mr. Curtice points out: How much employees should be paid, how long such payments should continue, what policy will prevail when employees quit voluntarily or are laid off because of strikes. State legislatures now handle these questions as they properly should, he says. GM employees made more money in 1953 than ever before, he notes.

GM now has no specific plans for Willow Run or Livonia, the GM head reports.

Production Cycle—In answer to questions on output, he expects 1954 output to be divided roughly 55 per cent in the first half and 45 per cent in the second, which was "our approximate pattern in 1953 and generally considered normal." Mr. Curtice also sees a shift back to fall auto introduction in the immediate future rather than the current December-January period.

Chrysler

The scrap is still coming, but it's harder to sell as . . .

Scrap Dealers Fight Market Doldrums

The mills and foundries just aren't buying. Delegates to the Institute of Scrap Iron & Steel meeting study remedies in freight rates, exports, cost-cutting, stockpiling

HOT METAL is presenting the nation's scrap iron and steel dealers with a burning problem. That's the inference left by speakers at the Washington convention of the Institute of Scrap Iron & Steel last week.

The scrap trade's problems include overexpansion, shrinking demand, exports, freight rates, public relations and fair trade practices. But many in the industry attribute most of their immediate troubles to increased use of hot metal by steel producers.

The Sum—Increased use of pig iron, greater steel mill dependence upon home and production scrap and curtailed steel making operations add up to trouble for scrap dealers. And the difficulties are compounded by the fact that many are short of cash reserves because they have spent millions on new equipment.

Ralph Ablon, retiring president of the institute, says the problem is a market which can't consume over 50 per cent of the scrap industry's total product. Thus, dealers near consumers are now unable to move all their production and dealers more remote from the mills and foundries often can't sell at any price. Institute Executive Vice President Edwin C. Barringer says that maintenance of a metallics charge of about 23.9 per cent purchased scrap, 27.6 per cent home scrap and 48.5 per cent pig iron or hot metal would assure a requirement for scrap that would at least help retain the machinery of collecting and preparing the material.

Solutions?—But how to assure even that? Suggestions include: Curtailed scrap yard operations, government stockpiling and mill stockpiling. But no one knew where the curtailing of yard operations should start. Government stockpiling was considered unwise, and mill stockpiling unlikely.

Exports may help some, but not much. Scrap men feel they're being discriminated against by the government through its rules on scrap exports. No such red tape is bound about exports of new iron and steel products. Last week, the Commerce department continued for the first quarter of 1954 the same policy, except for minor changes, in licensing ferrous scrap exports that prevailed last quarter.

Aid is also needed on freight rates. There are instances where it costs more to ship scrap than new iron and steel. Many dealers feel that the lower rates being extended by railroads to new iron and steel should also be granted on scrap.

Hope for the scrap industry also rests in lowering its costs with more and improved equipment.

The Statistics—Last year consumption of purchased scrap was an estimated 32 million gross tons, not quite up to the record 1951. But actual shipments probably set a peak because of increased consumer inventories (in the case of the steel industry estimated at 60 to 90 days).

Even though the steel industry operates at only 85 to 90 per cent of capacity this year, which means production of more than 90 million ingot tons, millions of tons of purchased scrap will be eventually required. As one scrap dealer says, "The scrap industry is sick, but there isn't anything that can't be cured with a little buying by the steel mills and foundries."

Just Elected—New officers of the institute: President, David C. Holub, Holub Iron & Steel Co., Akron, O.; first vice president, Leonard H. Krieger, Southwest Steel Corp., Pittsburgh; second vice president, Myron L. Chase, Luntz Iron & Steel Co., Canton, O.; secretary, Emmanuel J. Moskowitz, Schiavone-Bonomo Corp., Jersey City, N. J.; treasurer, Milton K. Mahler, Morrow Steel Co., Detroit. Mr. Barringer continues as executive vice president.

Payroll Hovers Near Peak

Average hourly pay of iron and steel workers was $2.323 in November, 1953, second highest monthly average ever paid. Peak was $2.328 paid in September, 1953.

So says the American Iron & Steel Institute in estimating the industry total payroll at $268,523,000 in November and $3,089,504,000 for 11 months of 1953. The 11-month figure exceeds any previous full year's total.

The iron and steel industry's total employment was 667,400 in November, 1953.

Army Cleans Up the Pantry

Contracts worth $500 million will get the ax as the Army tries new accounting method

THE ARMY, after taking a fresh look at its $30-billion inventories, is revising its housekeeping methods.

Contracts for more than $500 million in new goods and materiel will be canceled between now and the end of June. Also the Army is whittling away at its $2.5-billion pile of surplus goods. Selling surplus items for 12 to 15 cents on the dollar, monthly surplus sales average $150 million.

"How To" Story—Behind these Army economy measures is the adoption of a modern property accounting system. Deputy Undersecretary Harold S. Pearson says the Army hopes to get rid of the "dregs of two world wars and years of neglect" and be able to tell just how much of each item it has on hand quickly with the new system.

Under that system, stock levels will be cut down to 90 to 180 days' supply, and orders will be placed only six months ahead. That contrasts with the present stock levels of 15.7-months' requirements. "The Army expects to save up to $3 billion over the next two or three years through the new system," comments Mr. Pearson.

Good Housekeeping — Other measures being adopted include having 57 per cent of all commercial items shipped directly from the manufacturer to the consuming destination, by-passing the supply depot. And specific quantity orders have been substituted for annual open-end contracts on some 247,000 different items.

Army orders by June 30, 1954, will total only $5 billion compared with $11 billion last July 1 and $13 billion a year ago.

Small Business Cuts a Slice

Small business got more than half of the certificates of necessity issued by the Office of Defense Mobilization between Dec. 17 and Dec. 30.

Fifty-five write-offs were issued involving $75,383,801 in new or expanded facilities. Small business received 32 of those with facilities costing $46,323,384.

The three largest certificates went to: Van-Car Corp., Chicago, $42 million with 70 per cent allowed for railway freight car facilities; Chicago, Milwaukee, St. Paul & Pacific Railroad Co., $9,574,352 with 55 per cent allowed for railroad diesel locomotive facilities; and International Business Machines Corp., $6,068,000 with 60 per cent allowed for military electronic equipment facilities.

Among certificates issued during this period was one for $2.1 million to Inland Steel Co., Indiana Harbor, Ind., 50 per cent allowed, which covers construction of two batteries of soaking pit furnaces.

Defense Metal Needs Drop

Allotments of steel, copper and aluminum for "A" products for defense and atomic energy for the second quarter, 1954, are: Steel, 1,273,720 tons; copper and copper and brass alloys, 133,003,000 pounds; aluminum, 143,016,000 pounds. The figures represent a 13, 20 and 15-per-cent drop, respectively, over this quarter. The reason: Lower defense requirements.

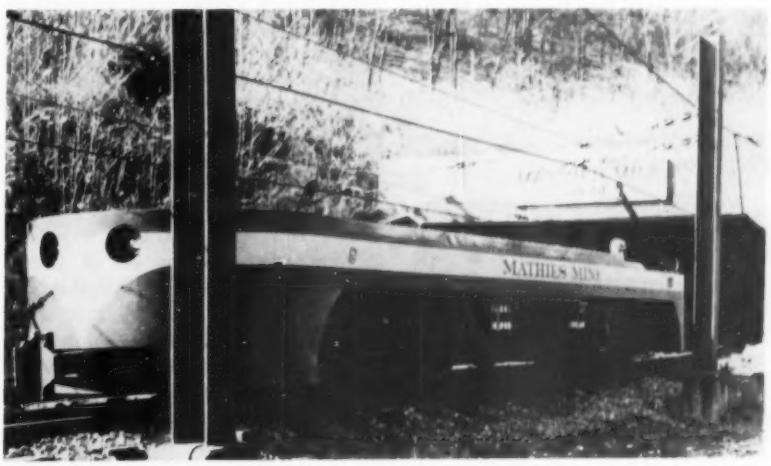
The total quantity of steel, copper and aluminum to be set aside at the mill level will include additional amounts required by manufacturers of "B" products.

GM Leads with Defense Awards

Aircraft and engine makers got the lion's share of the defense expenditures during the first half of 1953, Defense department figures show. Of the $18.4 billion in new orders placed, about 40 per cent went for airplanes and equipment, reflecting the administration's emphasis on air defense.

Defense awards figures over the three-year period ended June 30, 1953, show that the top 100 large corporations of the nation got 64 per cent of the contracts. The top five companies and the contracts they held as of June 30, 1953, are: General Motors Corp., $7.1 billion; Boeing Airplane Co., $4.4 billion; General Electric Co., $3.5 billion; Douglas Aircraft Co. Inc., $2.9 billion; United Aircraft Corp., $2.8 billion.

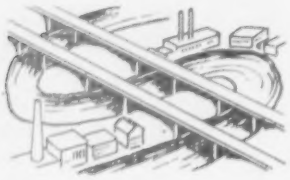
Officials point out that although there is a concentration of prime contracts with large companies, smaller firms get considerable business through subcontracts. The report also includes only contracts of $10,000 and above, and many small firms get smaller contracts not included in the report.



Big Pull for Underground Operation

This 600-horsepower locomotive, built by General Electric Co.'s Locomotive Car Equipment Department, is shown entering the Mathies Coal Co. mine where it is hauling record-length loads of coal. With a rated drawbar pull of 25,000 pounds, the locomotive is capable of pulling 1600 tons—about 110 loaded mine cars—on straight, level track. The mine, owned jointly by National Steel Corp., Youngstown Sheet & Tube Co., Steel Co. of Canada, and Pittsburgh Consolidation Coal Co., is operated by Pittsburgh Consolidation

By E. C. KREUTZBERG *Washington Editor*



Big Business From Water

THE WATER DEVELOPMENT recommendations included in President Eisenhower's state-of-the-union message are seen in Washington as presenting a potential antidepression program second in size only to highway construction.

It is estimated by the United States Public Health Service that $9 to $12 billion would be required to make the nation's streams resonably free of pollution. Another $12 to $15 billion could be spent in expansion and conservation. The picture is important to the metalworking industry which makes so many products that go with water work.

Unfortunately, we do not have the plans and the basic information for an all-out water program. C. G. Paulsen, chief hydraulic engineer, United States Geological Survey, says: "Water experts must all take a hand in these problems in logical sequence and with realistic vision. If not, we're in for piecemeal emergency-type developments, with real trouble looming in the future."

Plenty of Water . . .

With an average precipitation of 30 inches a year, we have more water than we are using or will use for a long time to come. But the pattern of our water resources was not designed by nature for our modern civilization. The Geological Survey reports that 1031 municipalities at some time between Jan. 1 and Oct. 1, 1953, restricted the use of water to all or part of their customers. At the very same time, other communities were stricken by floods.

Why the shortages? Demands exceeded existing sources of supply, particularly in growing communities and those with new industries. Treatment, storage and distribution systems were inadequate. In about one-third of the cases drought was a factor. In the majority of cases the shortages were due to insufficient planning and development—not enough cast iron pipe, pumps and treatment equipment were bought by these municipalities.

It Needs To Be Used Better . . .

The big need is conservation. Of our 30 inches of annual rainfall we are losing 8 inches through

wasteful runoff in streams. An undetermined large additional percentage is wasted by infestations of plants called phreatophytes, as the salt cedar which is common in the West. And when we allow the flow in our streams to thin down excessively, it becomes less fit for use. It all adds up to a need for more dams and reservoirs and less pollution.

What these dams do is illustrated in the case of the Mahoning. In October, 1953, 80 per cent of the flow in the Mahoning at Youngstown was being maintained by releases from upstream reservoirs. Take the Ohio; in October releases from nine dams kept coal moving and steel mills producing. Take industry at Kansas City; in October three-fourths of the flow in the Missouri river past that city was reservoir water released from the Fort Peck dam in Montana.

Certainly in the East, where streams in many cases are loaded not only with organic pollution but with industrial wastes and at low water, with salt from the ocean, more storage facilities are needed. The Delaware, whose newest large-scale industrial water user is the Fairless Works, is one stream eyed in particular by the Geological Survey, not only from the standpoint of pollution but because of the benefits that would result from upstream creation of more storage reservoirs. By controlling the flow, the upsurge of saline water from the ocean in times of low water would be avoided and upstream users would have a dependable fresh water supply.

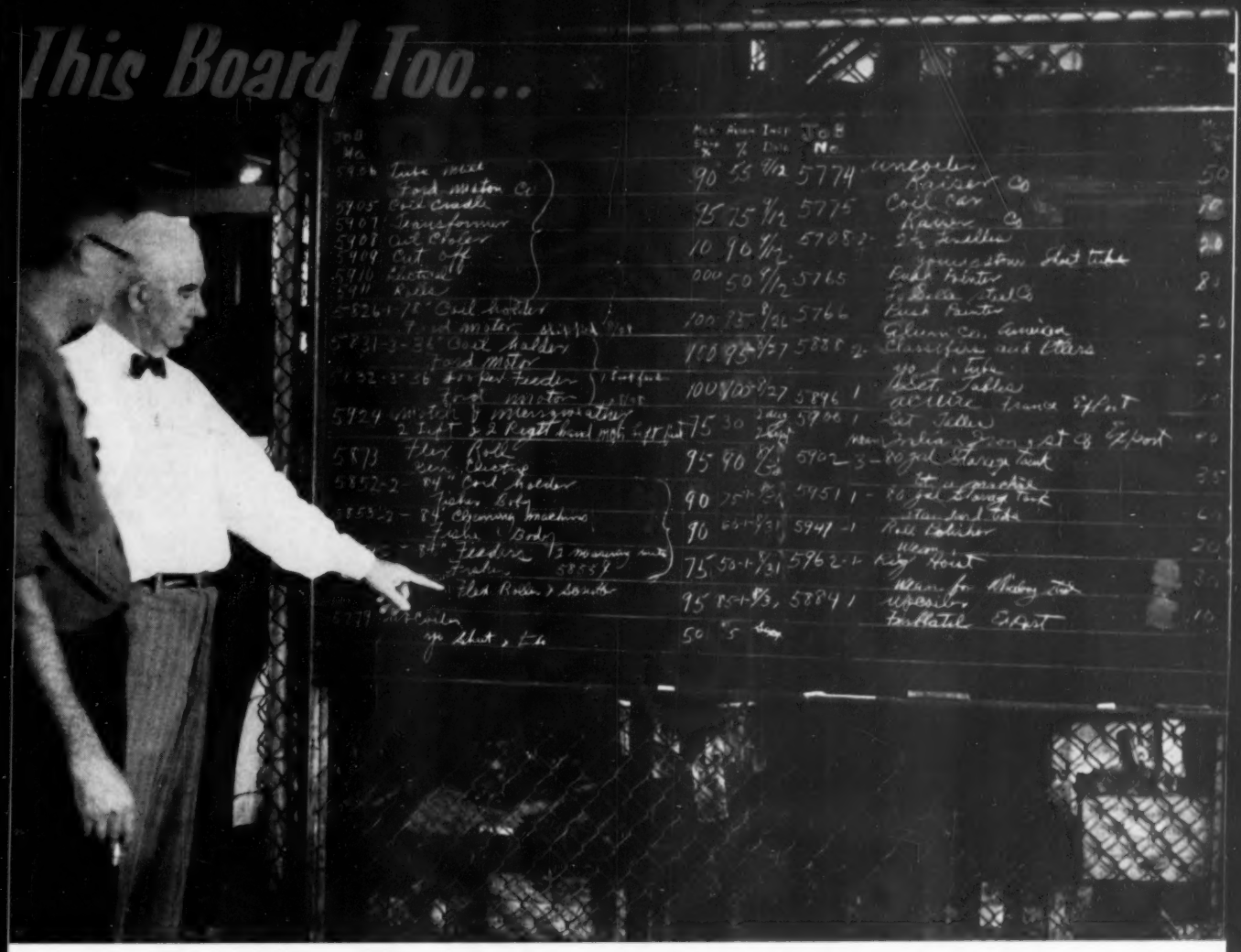
The Department of Interior is encouraged over prospects for developing a process for economical conversion of saline into fresh water. David S. Jenkens, co-ordinator of the Saline Water Conversion Program, is spending $400,000 a year on research in the $2-million program.

Industry Biggest Consumer . . .

Largest component in the nation's water demand is industry, which now is using 77 billion gallons daily and is expected to

double that demand by 1975. Industrial uses as a rule are not highly consumptive, since most industries return the water to the streams or to the ground.

However, there now is a trend toward reducing the amount of water for industrial use, particularly by industries located in the semiarid states of the West and Southwest. A new steam-electric plant at Amherst, Tex., uses just over one gallon of water per kilowatt-hour as compared with the 80 gallons used by conventional older plants. This trend is due to grow.



LISTS AMERICA'S FOREMOST MANUFACTURERS

Through the years this board has carried the names of America's best known manufacturers. They build their names on quality products at fair price and they must have sturdy, long-lasting, maintenance-free, high-production, precision equipment to achieve this end consistently. Getting just such quality equipment is the reason why their names appear on this board. For this is the Production Board at Plant 2 of the McKay Machine Company, one of the world's best known builders of standard and special metal working machinery.

For example, if you were to read the board the day the photographer took this picture you would find such familiar names as Ford Motors, Motch and Merryweather, Fisher Body, General Electric, Kaiser, Youngstown Sheet and Tube, Aluminum Company of America, Wean Engineering, Wheeling Steel, Standard Tube, and LaSalle Steel. At any other time, just as impressive a list of leading manufacturers could be found on this board.

So, if you use special or standard metal working equipment such as forming machines, draw benches, tube mills, levelers, upcoilers, strip processors, press feed lines, shear lines, coil handling equipment, join America's best known manufacturers on this McKay Production Board.

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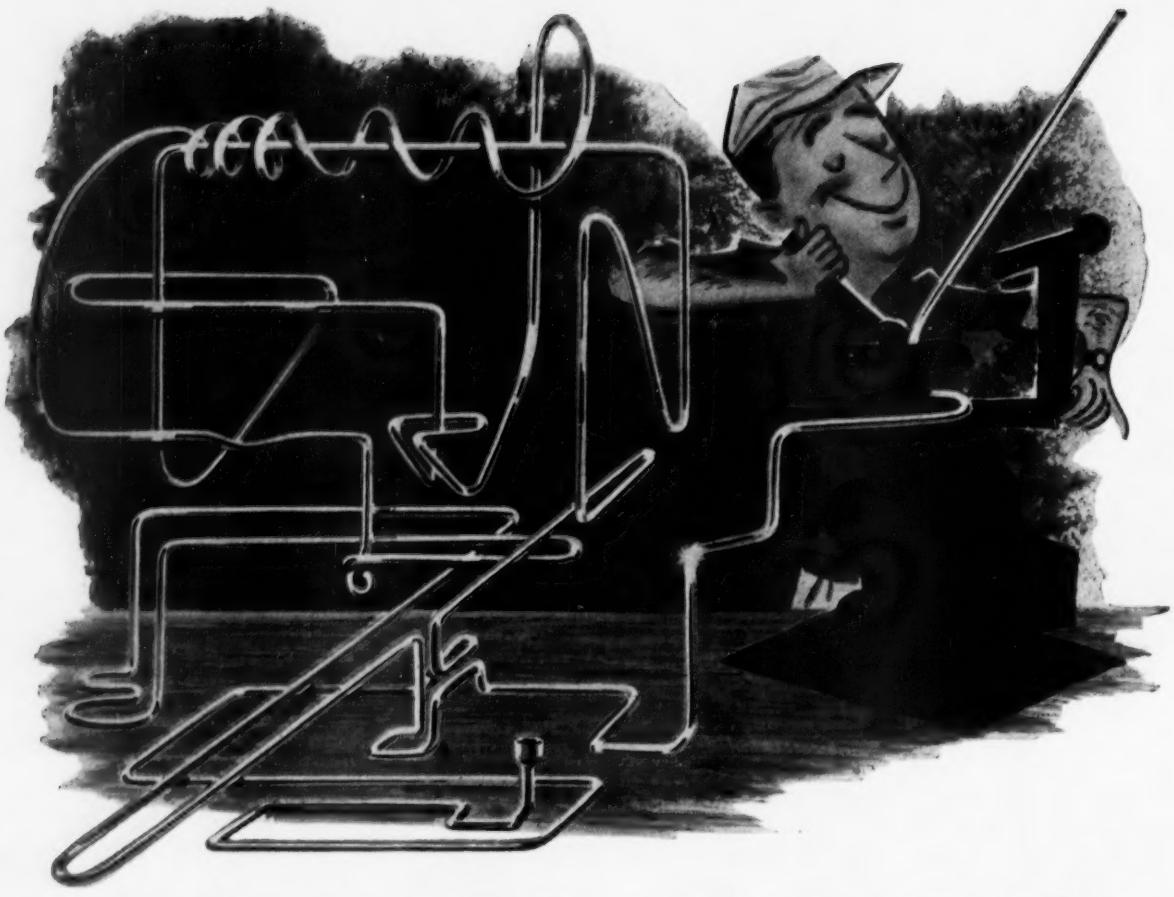

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European Export Prices on Downtrend

Prices on steel for export are being shaved, first by one group, then another. ECSC is looking for cheaper raw materials to make price reductions possible

EXPORT STEEL PRICES have not yet been stabilized in Europe.

Minimum price of British rerolled steel bars has been reduced twice during the past 12 months. But these reductions have not been successful in bringing in more work.

That's because other European quotations, such as those coming from Belgium and France, are still considerably below British.

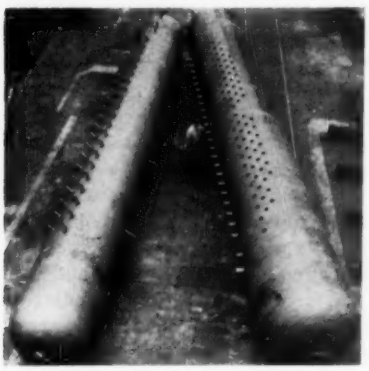
Other Reductions—Steel export prices quoted by the Brussels Convention organization have been reduced. The Brussels Convention (including Belgium, Luxembourg, France, West Germany and the Netherlands) is the organization made up of European Coal & Steel Community nations which sets prices on steel exports to nonmember countries.

Latest minimum prices in dollars per metric ton include: Merchant bars—$80 ($90 for U. S. and Canada); heavy and medium plates — $102; strip — $95; and light rails—$82.

The last round of reductions was considered necessary because many of the suppliers within the convention had been underquoting official prices by as much as $8 per ton.

Reductions Coming—A member of the High Authority of the ECSC has said that, while an increase in the community's steelmaking capacity was desirable and remained the ultimate target, it is first necessary for the community to get coal and iron at the lowest possible cost. Thus, ECSC investments will be directed initially at improving raw materials supplies.

That plan won't have an immediate effect on steel prices, of course. But it indicates the direction of European cost-cutting thinking.



British-Made Drums

Two forged steel boiler drums, each 42 feet long and over 19 feet in circumference, were made by the English Steel Corp. Ltd. for two new British Electricity Authority power stations

Export Indexes Down, Too

A quick look at the indexes of finished-steel product exports for the first nine months of 1953 shows one reason why major European steel producing countries are concerned with lowering prices. Only the West German index was higher in September, 1953, than at the beginning of last year.

	West Germany	France	Benelux	United Kingdom
Jan.	99	246	404	186
Feb.	88	276	312	149
Mar.	103	326	360	173
Apr.	141	341	366	163
May	126	282	352	172
June	141	335	381	169
July	190	264	358	195
Aug.	195	226	335	152
Sept.	166	228	328	158

Base: 1951=100.
Source: United Nations

Germans Look to Canada

German industrialists are looking to Quebec's Ungava region as a source for badly needed iron ore, according to Dr. A. Reifferscheidt, consul general for West Germany in Canada.

"Germany and Europe are a logical market for the ore," says Dr. Reifferscheidt. "German industry, which is expanding rapidly, needs ore and especially high-grade ore of the type available in northern Quebec. . . . Ungava is relatively far from the U. S. in terms of economical transport. But it is accessible to sea transports, which could carry the ore at reasonable freight rates to Europe."

Wide World

Blast Furnace for Germany

This modern blast furnace was put in operation on Jan. 18, 1954, at the Westfalenhuette works in Dortmund, Germany. Capacity of the 246-ft high furnace is 1200 to 1400 tons a day

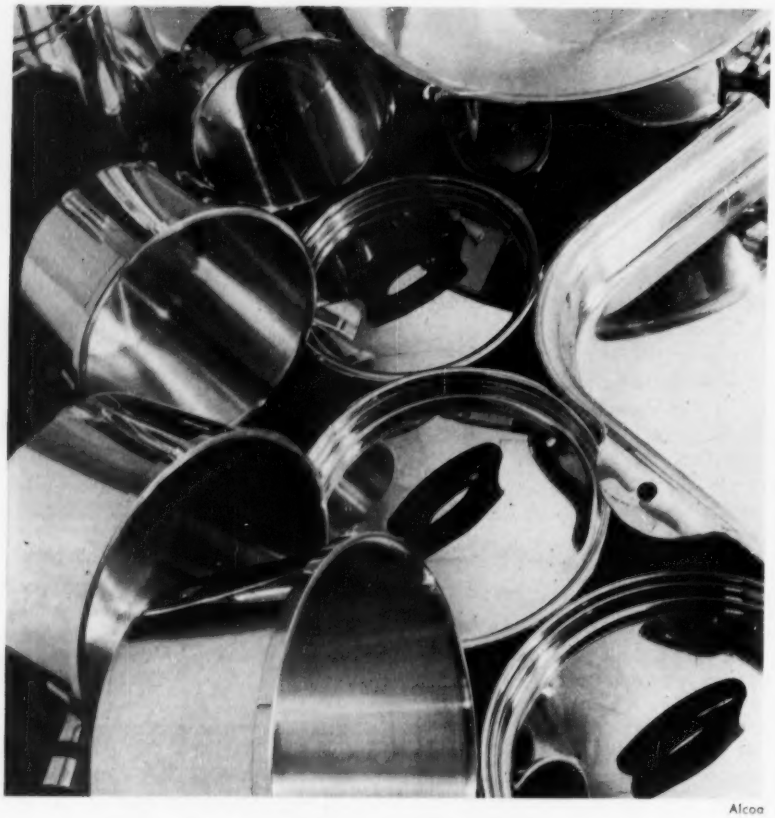
U.K. Buys from Russia

The British Iron & Steel Federation says its commercial organization, the British Iron & Steel Corp., has purchased 100,000 tons of pig iron from Soviet Russia. Large quantities of manganese will also be supplied by the Russians to Britain under new trade agreements.

Canada Automaking—Growing

Canada's three leading automotive manufacturers will complete new building projects costing approximately $125 million in 1954, William A. Wecker, president of General Motors of Canada Ltd., reports.

The automakers of Canada produced a record 485,000 units in 1953, 12 per cent above the previous year's figure. Last year's estimated payroll amounted to $145 million compared with $132 million in 1952.



Alcoa

ALUMINUM

brightens its home market

FROM WIRING to window screens, from doors to downspouts, aluminum commands increasing importance in the American home. Sales managers for the light metal exude confidence that more homes will use more aluminum this year, barring a slump in construction.

Aluminum men are talking expansion in the first half of 1954. Pointing up last year's increases, I. W. Wilson, president, Aluminum Co. of America, Pittsburgh, says primary aluminum output in the U. S. totaled about 1,250,000 tons in 1953. This is 313,000 tons more than was produced in 1952.

More for Building—Nichols Wire & Aluminum Co., Davenport, Iowa, conducted a survey late last year showing that building products consumed 280,000 tons of aluminum in 1953 compared with 202,000 tons one year earlier. Mounting sales of aluminum window frames, roofing and nails show that a substantial percentage of that total goes into residential construction.

G. J. Brenneman, assistant sales manager at Nichols, lists the light metal's features for household use: "Its light weight, freedom from corrosion, pleasing appearance, ease of fabrication and high electrical and thermal conductivity make it the ideal metal for many items in the home."

Aluminum House—A New Kensington, Pa., house incorporates these properties to the fullest extent. There Alcoa's engineers designed an experimental residence to show all possible household uses of the metal. Alcoa's development division tests aluminum wall paneling for soundness, aluminum piping and wiring systems for workability. As a result of similar tests aluminum heating systems in the home have been switched from floor to ceiling. Extensive testing developed the best alloy for window screening.

Through careful research, aluminum places its foot squarely in the threshold of the modern home. Leading applications of the metal in household construction include nails, storm doors and windows, gutters, downspouts and venetian blinds. Mr. Brenneman adds that roofing sheet, popular in farm and industrial buildings, is gaining in residential construction in several sections of the country.

On the Inside—Within an average home, casements, appliances, utensils and wiring are leading users of aluminum. Officials of Kaiser Aluminum & Chemical Corp., Oakland, Calif., say more orders call for aluminum window frames than for any other housing item. In the kitchen, your refrigerator may have aluminum panels and wire shelves. Your front door may have an aluminum lock or door closer. Your walls may have aluminum paint as a prime coating.

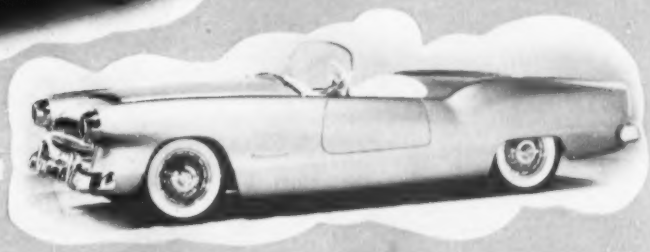
Will development of the light metal bring a 'war of metals'? Far from it, says Charles Braglio, assistant manager of Alcoa's development division. "Such features as aluminum sliding doors, aluminum foil and awnings create a new demand. Aluminum can bring certain new products within financial range of the householder. Since we can use aluminum in combination with other metals, any increased demand for our products often helps sell other materials."

Proven Value—Reynolds Metals Co., Louisville, Ky., says that research is bringing aluminum into a prominent place in residential construction as new products gain acceptance. Engineers point out that aluminum heating systems were once experimental, but are now used successfully. Similarly, aluminum pipe and fittings are now admittedly an innovation, but engineers foresee the time when it will be used in all types of plumbing. That's one reason why engineers think aluminum will take a bigger place in the average home in future years.

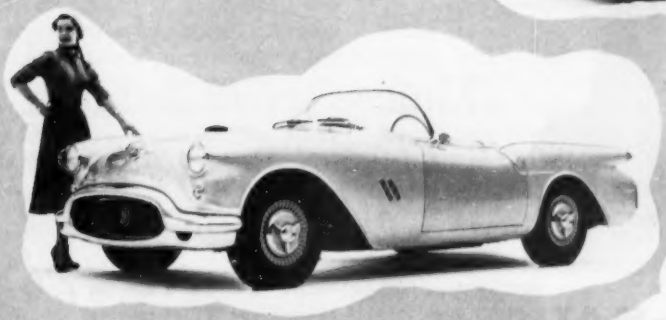
DREAM CARS

BUICK WILDCAT

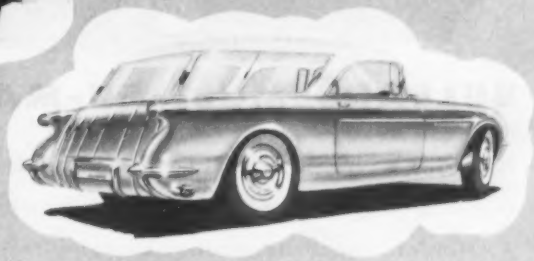
DODGE GRENADA



PLYMOUTH BELMONT



OLDSMOBILE F-88



CHEVROLET NOMAD

PONTIAC BONNEVILLE SPECIAL

FABULOUS dream cars are fast becoming the symbol of automobile sales promotion. Produced for the public to oh! and ah! over at auto shows, many never get beyond prototype models. The Chevrolet, Oldsmobile, Buick and Pontiac dreams above performed in the GM Motorama. The Plymouth Belmont was unveiled at the Chrysler International Salon in New York on Jan. 18, and the Dodge Grenada at the Southern California Auto Show in Los Angeles on Jan. 15. Can you buy them?—probably only in your dreams.

Seconds Count...

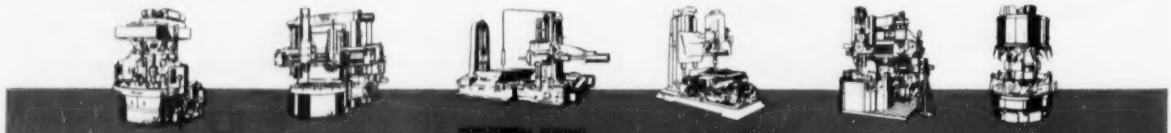
Time *is an Important Element in Profitable Manufacturing*

BULLARD MULT-AU-MATIC

Type "D" – 8"-12"-16" with 6 or 8 spindles
Type "D" – 16-23" and Type "K" – 6 spindles and 6 twin spindles – 8 spindles and 8 twin spindles

Hour after hour, the Bullard Mult-Au-Matic Method is proving its production capabilities in plants the world over in many and diversified industries. Years of constant development and improvement have proved the Mult-Au-Matic Method as a key unit for accurate and efficient repetitive production.

Seventy-three years of machine tool "know how" and craftsmanship have been skillfully combined in the Bullard Mult-Au-Matic – a machine that reduces manufacturing time and makes seconds count for profits. We invite your inquiries – write to your nearest Sales Office, Distributor or



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GM's Motorama in New York: A Proving Ground for Style

DETROIT

IT DOESN'T take a Freud to figure out what's behind the dream cars of the automakers. Not only do these drawing board scratchings pick up publicity like a Hollywood brawl, but they also introduce new styling ideas.

The dream car has become the proving ground of style, and therefore more than casual interest is to be accorded the 11 probes displayed at the General Motors' Motorama in New York last week.

Least Likely—Human nature being as it is, however, the car which drew top attention was the car least likely to succeed soon, GM's gas-turbine-powered "Firebird."

Particularly in evidence was speculation on top speed, probably not an outstanding feature of the car. However, the car is comparable in power and weight to Indianapolis cars and its top speed and performance should be similar, despite its Mach 2 styling.

For Conventional Use—What is interesting about the car, however, is the fact that GM reportedly has had several features of the car patented such as the transmission, and that some items like the outstanding brakes could lend themselves to conventional passenger car use. Also of interest is the new super high temperature alloy developed by GM research for the turbine buckets. Designated GMR-235, the buckets are precision investment cast and weigh only half an ounce on the gasifier turbine and less than two ounces on the power turbine. The engine's nozzle diaphragms were shell-mold cast from another new alloy, GMR-426W.

Suspension of the car is also of interest. The rear end is deDion with tubular swing axles, two single leaf springs. Front suspension is double wishbone with torsion bar and steering knuckles connected to the two wishbones by ball joints a la Lincoln. Steering is GM mechanical recirculating ball type. The over-all steering ratio is 20-to-1 with a maximum wheel pivot of 26 degrees. Two independent braking systems with a balancing piston to close off the intact system should the other fail is another interesting bit of GM thinking which like the suspension could prove adaptable to conventional cars.

Other Eye-catchers—Other cars on display, some of which are shown on page 59, include: Cadillac "El Camino" hardtop coupe, Buick "Wildcat II" sports convert-

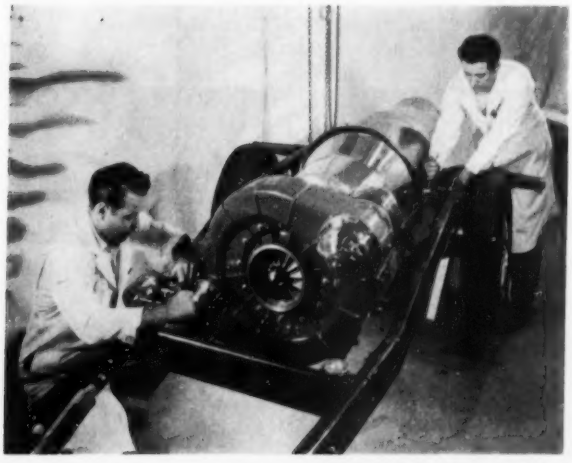
Auto, Truck Output

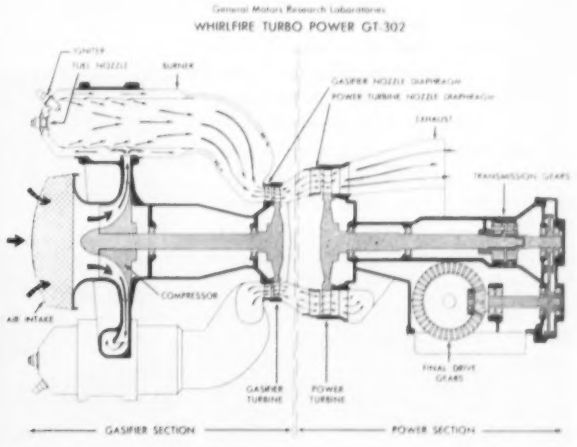
U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November	457,852	548,782
December	528,750	569,715
Total		5,989,509

Week Ended	1953	1952
Dec. 19	134,156	134,933
Dec. 26	92,247	102,558
	1954	1953
Jan. 2	93,293	106,102
Jan. 9	152,418	139,620
Jan. 16	149,852	148,049
Jan. 23	149,000*	149,578

Source: Ward's Automotive Reports
*Estimated by STEEL.





WHIRLFIRE TURBINE INSTALLED AND DIAGRAMMED

. . . an experiment in engine design for tomorrow's automobiles

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1954 NASH RAMBLER CROSS COUNTRY
. . . a stair-step roof for the baggage that now won't go inside

ible, Oldsmobile "Cutlass" hardtop, Pontiac "Bonneville Special" sports car, Chevrolet "Corvette Nomad" station wagon, Cadillac "La Espada" convertible, Cadillac "Park Avenue" sedan, Oldsmobile XP-20 convertible, Pontiac "Strato Streak" sports sedan and Chevrolet Corvette coupe. All cars feature fiberglas plastic bodies.

Nash-Hudson Engaged

The Motor City scarcely raised more than an eyebrow when directors of Nash-Kelvinator Corp. and Hudson Motor Car Co. announced their intentions to wed as American Motors Corp. Although final exchange of vows must await stockholder meetings of the two companies in March, the event is looked upon by most as a shotgun wedding under the brandishment of competition.

Combined assets of more than $355 million and working capital in excess of $100 million point toward a good nest egg for the couple, but the fact that nuptials have not yet taken place dampens speculation on their housekeeping arrangements. The fact that Nash and Hudson products are directly competitive from Rambler to Statesman and from Jet to Hornet leads to speculation about Jambler and Hash models. Certainly model consolidation can be looked for with the strong possibility of a luxury model addition to increase field coverage.

Combined auto output of the two firms was 244,507 units from Oct.1, 1952, through Sept. 30, 1953. On this basis, American Motors Corp. initially will be somewhat less than the Big Four, possibly about Big Four and One-Half. Based on 1953 output, if all the independents joined together the resultant combine initially would account for only 9.7 per cent of the auto market, less than half the output of Chrysler and Ford and only about one-fifth that of General Motors.

But tooling costs imminent for both companies should be lowered unitwise considerably by the move. Observer speculation is that models of the Rambler-Jet class will evolve toward the Chevrolet, Ford and Plymouth vein and will be concentrated in some plants of the new corporation. Heavy models will be coming from other plants of the firm with emphasis on interchangeability of basic engines and body shells among the lines. The trend is shifting from innovation of unique features to volume production among the independents.

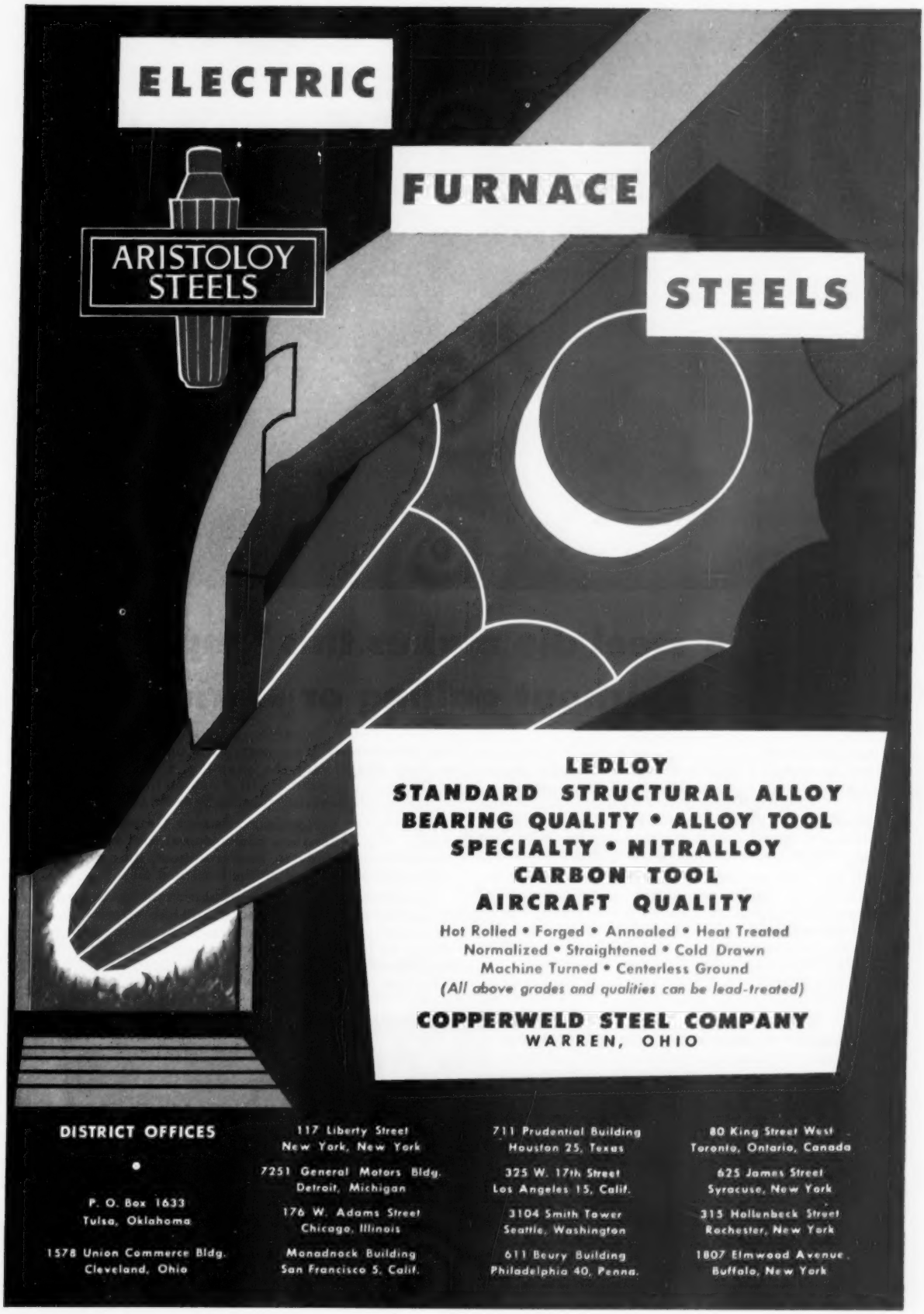
Cadillac for 1954

With an order backlog of 93,000 units before its new models were even announced, Cadillac finds itself in a position unique in the automotive industry. An entire year's production of the "Standard of the World" lies in the neighborhood of 110,000 units so there appears little chance that the trade-in value of your Caddie will slip much should the 1954 job catch your eye.

Catching your eye is one of the jobs the 1954 Cadillac is expected to do best, as a glance at the photo below will show. Additionally, a new chassis with a 3-inch wheelbase increase, modified front suspension and new rear springs are said to improve riding and handling qualities. Power steering is now standard equipment on all Cadillacs with a reduced steering ratio. An interesting touch is a co-ordinated windshield washer which starts the wiper blades when the washer button is pressed and stops them when the fluid stops flowing. Clue to the gadget is a solenoid actuated by the same vacuum which squirts the fluid.

The engine has been lowered in the chassis 2 inches. Through an 8.25 to 1 compression ratio, 4-barrel carburetor and high lift cams, Cadillac horsepower comes out at 230 this year. Although 5 hp under Chrysler, Cadillac will make its sales pitch on greater horsepower at the rear wheels.

1954 CADILLAC 60 SPECIAL FLEETWOOD SEDAN
. . . longer, lower, speedier and equipped with automatic everything


ELECTRIC
FURNACE
STEELS
ARISTOLOY
STEELS
LEDLOY
STANDARD STRUCTURAL ALLOY
BEARING QUALITY • ALLOY TOOL
SPECIALTY • NITRALLOY
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Hot Rolled • Forged • Annealed • Heat Treated
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117 Liberty Street
New York, New York
7251 General Motors Bldg.
Detroit, Michigan
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Monadnock Building
San Francisco 5, Calif.
711 Prudential Building
Houston 25, Texas
325 W. 17th Street
Los Angeles 15, Calif.
3104 Smith Tower
Seattle, Washington
611 Beury Building
Philadelphia 40, Penna.
80 King Street West
Toronto, Ontario, Canada
625 James Street
Syracuse, New York
315 Hollenbeck Street
Rochester, New York
1807 Elmwood Avenue
Buffalo, New York

Graph-Mo® steel die makes this "impossible" draw without galling or scoring

MANUFACTURERS Service Company in Cleveland was faced with a tough problem of making a die for a dryer fan housing 3⅛" deep. The scroll shape made it an all but impossible draw for ordinary die steels—they'd pick up and gall. Looking for an answer, they tried Graph-Mo®—one of four graphitic tool steels developed by the Timken Company. Result: good clean parts, no scuffing, no galling, no scoring.

Graph-Mo tool steel can handle jobs like this because of its unique composition. It contains free graphite, one of the best natural lubricants. This graphite gives Graph-Mo outstanding anti-friction properties and prevents scuffing and galling even in such difficult draws as this one.

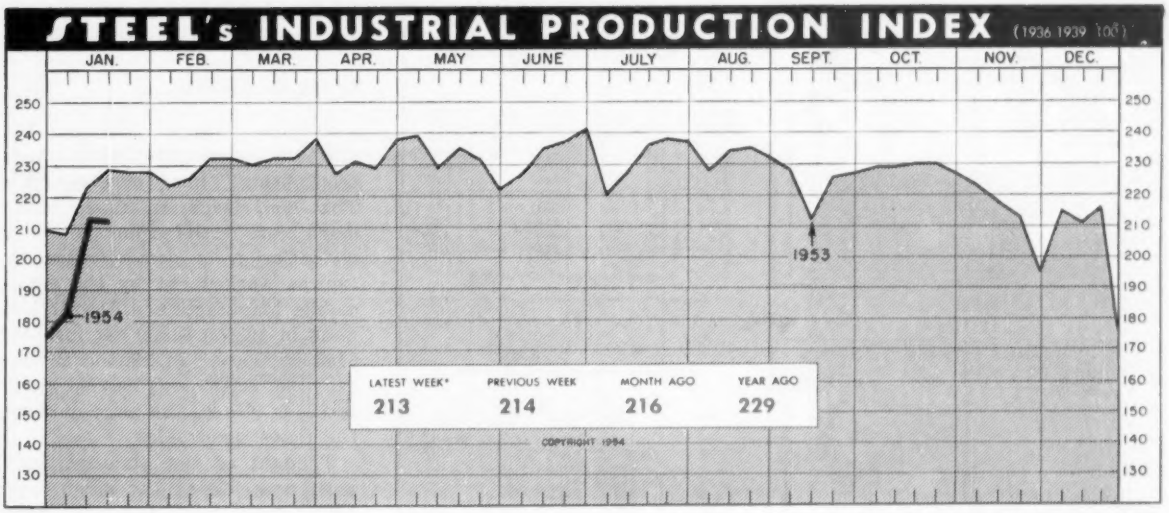
Graph-Mo has a second great advantage over conventional tool steels: It outwears them on an average of three to one. Along with the graphite, Graph-Mo contains millions of tiny particles of diamond-hard carbides, one of the hardest-wearing substances known.

Despite its superior wear resistance, Graph-Mo machines about 30% easier than conventional tool steels. And it responds uniformly to heat treatment, thus requiring a minimum of grinding on the hardened dies.

Graph-Mo is one of four graphitic tool steels developed by the Timken Company. Would you like more information about their uses in dies, punches, gages and machine parts? Write for the new Timken Graphitic Steel Data Book just out. The Timken Roller Bearing Company, Steel & Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO."

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Jan. 16

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Farm Prices Rise as Some Appliances Slip Down

FARM EQUIPMENT DEALERS and manufacturers are cheering on the rise in farm prices. They hope the higher prices will result in increased sales. "Pickins" in 1952 were on the slim side. With business in general on the downgrade and farm costs up, the problem may be to hold to the 1952 level.

Reason for Gain . . .

December advance in farm prices, primarily due to limited offerings of livestock and some grains, quickened during the early part of January. On Jan. 12, Dun & Bradstreet's wholesale food price index showed the sharpest weekly rise in over six years. It jumped from $6.85 to $7.03 to reach the highest level in 31 months.

Primary Prices Rise . . .

Recent gains in the primary markets, caused almost entirely by the farm price advance, are in contrast to the anticipated slightly downward, longer-term trend. The Bureau of Labor Statistics' wholesale price index pointed to 109.8 per cent of the 1947-1949 average in November; in the week ended Jan. 12 it had moved up to 110.9 per cent.

Appliance Prices Skid . . .

To spur greater retail sales, some manufacturers have reduced prices on TV sets, air conditioners and electric bed coverings. It seems that the lower prices have been made possible by reduced costs and expiration of the excess profits tax. Inventory corrections do not figure as importantly.

Petroleum Plight . . .

Plagued by inventory troubles is the petroleum industry. The many and repeated fourth-quarter reductions in crude oil allowable did not bring stocks into balance with demand, which was less than had been anticipated. Pipelines and storage are so full now that refiners have reduced prices of regular grade gasoline for the fourth time since November.

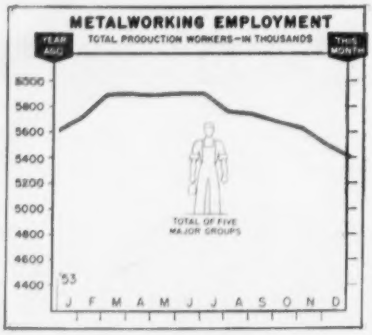
Output Moving Sidewise . . .

While durable goods prices are showing a tendency to move downward, industrial outturn appears ready to start a sidewise movement, one that might have a slight rise to it. During the week ended Jan. 15, the components of STEEL's industrial production index remained almost unchanged from the preceding week. On a preliminary basis output slipped to 213 per cent of the 1936-1939 average, one percentage point below the previous week and 16 points below the comparable week last year.

Maintaining Profits . . .

Clamor of recent automotive developments points out one of the best ways to maintain profits in a period of declining sales. Sometime in January the 1-millionth power steering unit will be installed. In 1953, the sum total of cars so-equipped shot to 730,449, a 265 per cent gain over the 200,000 marketed in 1952. And in 1951 only Chrysler had power steering. Average price cuts on power steering of 24 per cent this year attest to engineering improvements and the cost-cutting benefits of mass production.

Last year 50.1 per cent of U. S. automobiles were sold with auto-

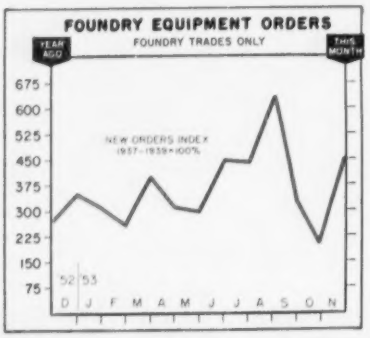

METALWORKING EMPLOYMENT
TOTAL PRODUCTION WORKERS—IN THOUSANDS
YEAR AGO
THIS MONTH
TOTAL OF FIVE MAJOR GROUPS
'53
J F M A M J J A S O N D

Metalworking Employment
In Thousands

Production Workers—Five Major Groups

1952	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Dec.	1,183	881	1,283	800	1,460
1953					
Jan.	1,188	891	1,289	804	1,484
Feb.	1,142	942	1,323	916	1,543
Mar.	1,145	952	1,335	925	1,574
Apr.	1,144	952	1,321	926	1,576
May	1,138	952	1,307	919	1,556
June	1,143	956	1,300	911	1,548
July	1,134	938	1,264	892	1,533
Aug.	1,131	950	1,236	903	1,523
Sept.	1,117	944	1,228	913	1,493
Oct.	1,103	930	1,216	906	1,482
Nov.	1,082	908	1,204	888	1,417
Dec.	1,056	871	1,202	863	1,407

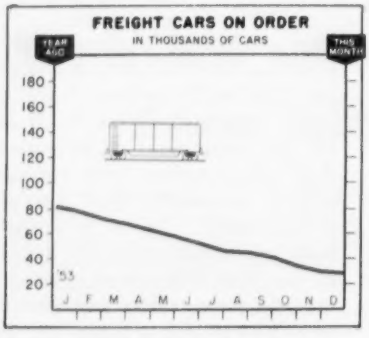
U. S. Bureau of Labor Statistics.



Foundry Equipment Orders

	Index (1935-1939 = 100)		Value, Thousands	
	1953	1952	1953	1952
Jan.	301.0	404.5	$1,379	$1,862
Feb.	207.3	200.4	1,179	922
Mar.	396.7	310.0	1,818	1,427
Apr.	303.0	385.1	1,305	1,773
May	294.4	225.2	1,568	1,037
June	446.8	353.8	2,998	1,629
July	440.8	243.9	2,362	1,583
Aug.	633.3	311.6	3,615	1,434
Sept.	317.2	365.9	1,575	1,685
Oct.	202.9	335.8	1,099	1,538
Nov.	455.8	258.1	2,190	1,183
Dec.	....	343.3	....	1,573

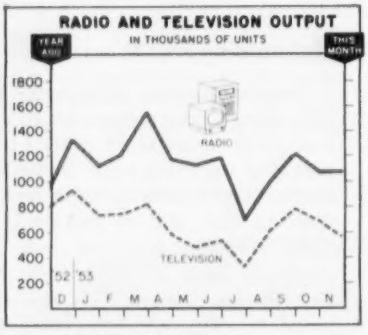
Foundry Equipment Mfrs. Assn.



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1953	1952	1953	1952
Jan.	5,536	5,338	77,414	120,251
Feb.	2,284	7,358	71,882	118,900
Mar.	3,379	5,619	68,553	115,854
Apr.	2,432	397	62,637	108,270
May	1,651	2,502	57,345	103,910
June	1,463	3,264	52,315	99,615
July	1,632	1,536	47,423	95,265
Aug.	3,913	4,558	45,735	95,761
Sept.	3,914	3,628	42,198	95,377
Oct.	1,705	1,423	35,171	90,708
Nov.	2,860	2,878	31,869	87,657
Dec.	2,159	1,159	29,950	80,296
Total	....	....	37,261	

*End of month.
American Railway Car Institute.



Radio and Television Output
Thousands of Units

	Radio		Television	
	1953	1952	1953	1952
Jan.	1,093	632	719	405
Feb.	1,192	759	731	409
Mar.	1,549	976	810	511
Apr.	1,158	848	568	323
May	1,109	748	482	309
June	1,164	874	524	361
July	674	442	316	199
Aug.	992	544	604	398
Sept.	1,217	866	770	756
Oct.	1,052	772	680	724
Nov.	1,066	924	560	780
Dec.	....	1,325	....	921
Total	....	9,711	....	6,096

Radio-Electronics-Television Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction ..... Dec. 28	Ironers ..... Nov. 23	Refrigerators ..... Nov. 2
Durable Goods .... Dec. 14	Machine Tools .... Dec. 7	Steel Castings .... Jan. 18
Employ. Steel ..... Nov. 30	Malleable Castings Jan. 18	Steel Forgings .... Jan. 18
Fab. Struc. Steel .. Dec. 21	Prices, Consumer .. Dec. 7	Steel Shipments .. Jan. 11
Furnaces, Indus. .. Dec. 7	Prices, Wholesale .. Nov. 30	Vacuum Cleaners .. Jan. 11
Gray Iron Castings Jan. 18	Pumps ..... Nov. 16	Wages, Metalwk. .. Dec. 28
Gears ..... Dec. 21	Ranges, Elec. .... Nov. 2	Washers ..... Dec. 21
Indus. Production .. Nov. 23	Ranges, Gas ..... Jan. 11	Water Heaters .... Jan. 11

matic transmissions, pushing manual gear shifters into the minority for the first time. Including the latest models, these devices are now available on all 18 car makes.

Taxes Hurt More . . .

Reduced sales pace foreseen for this year, as compared with last, is spotlighting tax developments. That an attack on taxes is on much more fertile ground than one on inflation is demonstrated by figures worked out by the Automobile Manufacturers Association. Back in 1939 a $1000 car included $143 in taxes. In 1952 the same car cost $2000 and carried taxes of $583. Where the price doubled, the taxes quadrupled.

Thought of tax dividend relief gave new life to the stock market. Price level not only commenced to show a seasonal rise, but climbed to the highest point in eight months.

Down from the Heights . . .

Downtrend of the economy from mid-1953 to the present is brought out well by some recently received figures. Judged by the number of operating businesses in the U. S. the Korean War build-up reached a peak in mid-1953. Although the number of active entities totaled 4.25 million, a record, the rate of growth of the business population had begun slowing down. Net gain of 30,000 firms during the first half of last year was lower than the comparable period for each of the three preceding years. Slowdown not only was caused by a decline in the rate of new business formations but also by an increase in the number of businesses discontinued, the Office of Business Economics says. But, through June, 1953, contract construction continued to show the greatest strength among the major industry divisions.

Liabilities Rise . . .

Number of business failures, 202 during the week ended Jan. 7, according to Dun & Bradstreet, seems to be continuing on a level at least as high as in the last two months of 1953. In addition, the number of failures with liabilities of $5000 or more may be

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	74.5	75.0	99.5
Electric Power Distributed (million kwhr)	9,014	8,825	8,121
Bitum. Coal Output (daily av.—1000 tons)	1,359	1,157	1,600
Petroleum Production (daily av.—1000 bbls)	6,250[1]	6,284	6,468
Construction Volume (ENR—millions)	$195.8	$225.9	$323.7
Automobile, Truck Output (Ward's—units)	149,852	152,418	148,049
TRADE			
Freight Car Loadings (unit—1000 cars)	635[1]	624	705
Business Failures (Dun & Bradstreet, no.)	200	202	158
Currency in Circulation (millions)[3]	$30,284	$30,591	$29,884
Dept. Store Sales (changes from year ago)[3]	+7%	0%	−3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,384	$18,937	$16,551
Federal Gross Debt (billions)	$274.9	$275.1	$267.3
Bond Volume, NYSE (millions)	$26.7	$16.7	$19.7
Stocks Sales, NYSE (thousands of shares)	7,590	7,083	7,723
Loans and Investments (billions)[4]	$80.8	$81.3	$78.1
U. S. Gov't Obligations Held (billions)[4]	$32.9	$32.8	$32.4
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	205.7	205.5	213.2
All Commodities[7]	110.9	110.4	109.9
Commodities Other Than Farm & Foods[7]	114.5	114.5	113.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

moving upward sharply. And judged by the week of Jan. 7, retail trade mortalities not only continued to rise, but the speed of ascent can be measured by the expanded number of large liability failures.

Profit Cut . . .

Average annual rate of profit of U. S. manufacturing corporations on the equity of stockholders fell from the second to the third quarters of 1953, the Securities & Exchange Commission reports. At the end of the July-September period profits before taxes were at an annual rate of 23.3 per cent, 3.1 per cent below the April-June rate.

Metal producing and metalworking industries were struck hardest by the profit slide. Rate of profit before taxes on shareholdings in the motor vehicle and parts industry took the worst beating. It plummeted from an annual rate of 50.1 per cent during the second quarter to 36.6 per cent in the third.

Stabilizing the Backlog . . .

Backlog of orders for the products your company sells showed no further weakness in December, the Purchasing Agents Association of Chicago says. Related to its survey figures, that doesn't mean backlogs aren't declining, but rather that the decline is slowing.

Metalmen Pay Off . . .

Net effect of the precipitous decline in business loans during the week ended Jan. 6 in New York and in all other major cities except Dallas was a record weekly fall of $438 million in total commercial, agricultural and industrial loans, the Federal Reserve Bank reveals. Largest repayment of $152-million was made by manufacturers of metal and metal products.

Trends Fore and Aft . . .

The 17,000 claimants for unemployment compensation in Cleveland in the week ended Jan. 15 exceeded the number for all previous weeks, including the 1952 steel strike period, since mid-1950 . . . Over-all level of heavy industrial construction will be kept as high this year as last due especially to the demand for petro-chemical and power plant construction, John J. O'Donnell, retiring president, National Constructors Association, said in a speech before the annual convention.

STEEL BALLS

• • •

Chrome Alloy and Stainless

• • •

FINEST ELECTRIC FURNACE STEEL HEAT TREATMENT LAPPED FINISHES

These factors combine to make the finest steel balls obtainable because they contribute to closer surface uniformity — better strain distribution — higher load carrying capacity — longer life.

Used in BALL BEARINGS • AUTOMOTIVE • AIRCRAFT • FARM AND INDUSTRIAL EQUIPMENT • MACHINE TOOL • OIL WELL AND OTHER IMPORTANT APPLICATIONS

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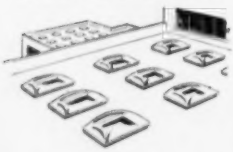
FASTEST THING IN FASTENINGS®

WASCOLITE SKYDOMES ...shed light on 66% Production Savings!



SPEED NUTS® solve fastening problem on new unit for WASCO FLASHING CO.

Wascolite Skydomes, the newest thing in modern sky-lighting, required a more efficient attaching method for installation.

To find the answer, Tinnerman Field Engineers working with WASCO from the design stages, made a Fastening Analysis survey on this new unit. Standard "U"-Type SPEED NUTS were recommended to replace clinch type fasteners used in the old design. These SPEED NUT Brand Fasteners snap on by hand, are self-retaining in screw-receiving positions, and are ideal for blind locations. The result is a double savings . . . 66% in assembly time, plus a 76% reduction in material and handling costs!

Dollar-saving examples like this show you how Tinnerman can help with your assembly fastening problems. Call our representative for complete Fastening Analysis information. There's no cost or obligation for this service!

"U"-TYPE SPEED NUTS

These standard Tinnerman fasteners snap over panel edges by hand. They are self-retaining in center hole locations providing quick, easy fastenings even in blind assemblies. A full range of panel thicknesses and screw sizes are available to meet your needs.

Write today for your "SPEED NUT Savings Stories" booklet of typical Tinnerman savings to industry: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio.

In Canada: Dominion Fasteners Ltd., Hamilton, Ont. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A.—7 rue Henri Barbusse, Levallois (Seine).

TINNERMAN Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES

EVAN W. McNEILL
. . . v. p., Ohio Seamless Tube Div.

FREDERICK O. DETWEILER
. . . heads Chance Vought Aircraft

KENNETH H. FLORY
. . . Flexonics Corp. purchasing agent

Evan W. McNeill was appointed vice president in charge of Copperweld Steel Co.'s **Ohio Seamless Tube Division**, Shelby, O. Associated with the division since 1930, he succeeds **W. C. Connelly** who has directed the Shelby operations since 1938. **Merle Hoffman** was made assistant secretary and division controller and **John Hoak** assistant treasurer.

Henry H. Howard was elected a vice president of **Caterpillar Tractor Co.**, Peoria, Ill. His principal responsibility will be administration of the firm's recently created engine division.

Progressive Welder Sales Co., Detroit, appointed **Lester J. Blackford** general sales manager. He was in charge of its Viking Sales Division.

William S. Rheem II has moved up from assistant to general manager of all domestic manufacturing and marketing activities of **Rheem Mfg. Co.**, San Francisco. He succeeds **C. V. Coons**, a vice president and director, named resident director at New York.

Dudley J. Brown was appointed executive assistant of sales, **Lamson & Sessions Co.**, Cleveland. **Thomas B. Judd** was promoted to aircraft sales manager and **A. H. Schaefer** was made price co-ordinator.

Frederick O. Detweiler was elected president of **Chance Vought Aircraft Inc.**, Dallas. He had been general manager of Chance Vought Aircraft Division, United Aircraft Corp. Under terms of a recently announced plan, however, Chance Vought is separating from United Aircraft and, during this year, will become a completely independent corporation. Other officers elected are **Adm. H. B. Sallada**, USN (ret.), vice president; **N. V. Turney**, controller; **B. W. Whitten**, treasurer; and **J. J. Gaffney**, secretary.

W. M. Trigg was named manager of **Westinghouse Electric Corp.'s** new metals development plant to be built at Blairsville, Pa. Named to assist him are **Leonard W. Golden** and **R. D. Rowley**. Mr. Golden will be in charge of metals casting and manufacture of powdered metal parts; Mr. Rowley of wrought alloy manufacture. The new metals development plant will be known as the materials pilot manufacturing department.

Walter Johnson was appointed manager of the Canton, O., forge plant of **Ford Motor Co.**, and **R. E. Skinner** was made assistant plant manager.

Charles C. Gallicano was appointed assistant to the president, **American Car & Foundry Co.**, New York.

Kenneth H. Flory was made purchasing agent of **Flexonics Corp.**, Maywood, Ill. He succeeds **R. E. Anderson**, resigned. He joined the firm, formerly Chicago Metal Hose Corp., in 1948 and was assistant purchasing agent prior to his appointment.

James A. Lee was appointed director of procurement for **Nash-Kelvinator Corp.**, Detroit. He has served as purchasing director of the Nash Division since 1946. **J. L. Brown** will serve as administrative assistant to George Romney, executive vice president.

Louis C. Galleher was named sales manager, clutch and transmission division, **Salsbury Corp.**, Los Angeles.

Fred C. Warren was elected president and **Philo J. Harvey** executive vice president, **Edward D. Maltby Co. Inc.**, Los Angeles.

New officers of **Mississippi Valley Structural Steel Co.**, Chicago, include **R. J. Wood** as vice president and plant manager at Decatur, Ill.; **G. W. Schlutius**, vice president and St. Louis plant manager; **J. C. Arntzen**, vice president and plant manager at Melrose Park, Ill.; **E. D. Prescott**, secretary, Melrose Park; and **A. O. Muehlenbrock**, assistant secretary, St. Louis. Retirements announced by

S. B. WITHINGTON
. . . heads Avco's Lycoming Div.

F. S. PERKINS
. . . Globe Steel Tubes purchasing agent

THEODORE C. KOCH
. . . Ace-Central States gen. mgr.

the company include **Ralph R. Bramhall,** vice president at St. Louis; **Richard E. Carr,** vice president and manager of the Decatur plant; and **Fred C. Knorr,** secretary of the company.

S. B. Withington was named president of the newly consolidated Lycoming Division of **Avco Mfg. Corp.,** New York. He will continue as general manager of Lycoming and as a vice president of the parent company. Appointments of six other Lycoming Division officers include: **Floyd J. Bird,** vice president and plant manager, Williamsport, Pa.; **Dr. Anselm Franz,** vice president, turbine engineering; **Clarence J. Mason,** controller; **James E. Mitchell,** vice president-industrial relations; **Arthur Nutt,** vice president-engineering; and **Donald F. Turner,** vice president and plant manager, Bridgeport, Conn. Mr. Withington will continue supervision of sales and as Lycoming president has responsibility for operations in the division's two plants, at Stratford, Conn., and Williamsport, Pa.

William A. Bauer was elected president, **Baker-Raulang Co.,** Cleveland. Chairman of the board since 1951, he becomes both chairman and president. **James W. Moran,** former president, has retired. **Charles N. Sumwalt Jr.** was appointed executive vice president. He was formerly vice president in charge of the company's eastern sales division.

F. S. Perkins, purchasing agent for **Globe Steel Tubes Co.,** Milwaukee, was given full responsibility of the purchasing department upon retirement of **A. Korsan.**

Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa., appointed **John A. Vanyo Jr.** assistant sales manager; **O. H. Keeling** manager of combustion control engineering; and **R. L. Bruce** senior contract engineer.

Howard M. Palmer was appointed sales vice president, **Lewis-Shepard Products Inc.,** Watertown, Mass. He was formerly general sales manager, a position he held for the last three years.

HOWARD M. PALMER
. . . sales v. p., Lewis-Shepard

Theodore C. Koch, formerly vice president in charge of manufacturing, was made general manager of **Ace-Central States Machine Tool Co.,** Detroit. Ace-Central States was formed in 1953 by Ace Tool & Die Co. and Central States Engineering Corp., both of Detroit. Both these companies continue as separate business entities and Mr. Koch, in addition to being general manager of Ace-Central States, continues as vice president of Ace Tool & Die Co.

N. K. Pettigrew, formerly vice president in charge of operations for research and development, C. I. Hayes Inc., Providence, R. I., has joined the newly organized company of **Associated Designers & Builders,** Providence.

At **Le Roi Co.'s** Milwaukee works, **Louis Dondero,** production manager, was promoted to assistant works manager. **Ralph L. Brezinski** was named production manager and **Robert D. Anderson** assistant production manager.

Pressed Steel Tank Co., Milwaukee, appointed **Edward Elliott Jr.** to cylinder sales manager and **Ross H. Dean** to special products sales manager.

At **Marquardt Aircraft Co.,** Van Nuys, Calif., **Harold Frye** was appointed manager of quality control. **Roy Sottosanti** was promoted to chief inspector, **Joseph Kramer** was made special assistant to factory superintendent, and **Ed-**

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Forged clutch shaft weighing approximately 11 lbs. Its odd shape requires exceptionally good die design to forge the unit in one piece. Good engineering and proper die design is typical of service at T&W.

Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

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STEEL FORGING CORPORATION • ALLIANCE, OHIO

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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

T. C. HADDEN, JR.
. . . Ward Leonard Electric p. a.

ROBERT E. LEONI
. . . Wm H. Muller & Co. president

KEMPTON DUNN
. . . American Brake Shoe president

ward Wenzlik becomes manager of systems and procedures.

Ward Leonard Electric Co., Mt. Vernon, N. Y., appointed **T. C. Hadden Jr.** purchasing agent. He was formerly with Western Electric Co. Inc. as a buyer at its purchasing division headquarters.

James Riley was made director of material and production control at Ypsilanti, Mich., for **General Motors Corp.'s** transmission division.

William E. Bryden was appointed sales manager of **Coolidge Corp.**, Middletown, O.

Dr. R. W. Sandelin was appointed technical director, **Alloy Metal Wire Co.**, Prospect Park, Pa., division of H. K. Porter Co. Inc.

Robert E. Leoni was elected president, **Wm. H. Muller & Co. Inc.**, New York, and its associated companies. He succeeds the late **J. Frering.** Mr. Leoni has been executive vice president of the company. **John D. Ricards** was elected vice president and **Paige A. Moore** treasurer.

Joseph T. Ryerson & Son Inc. appointed **Weaver E. Falberg** assistant general manager of sales of its 16 steel service plants. He will have headquarters in Chicago. Mr. Falberg was formerly manager of the alloy steel division. **Roland W. Burt** was made manager of the Chicago plant, a newly created position. Succeeding him as sales manager, Chicago, is **Alfred J. Olson.**

Kempton Dunn, first vice president of **American Brake Shoe Co.**, New York, was elected president. **Maurice N. Trainer**, president since 1950, has reached retirement age and was appointed to the newly created post of vice chairman. The changes are effective Feb. 1.

LeTourneau-Westinghouse Co., Peoria, Ill., appointed **W. E. Hendricks** domestic sales manager to succeed **H. R. Powers**, resigned, and **Lloyd Rager** as sales promotion manager.

World Steel Products Corp., New York, elected **S. K. Mittleman** president. Formerly executive vice president of Aetna Steel Products Corp., he now succeeds **J. C. Sussman**, who remains as chairman of World Steel Product's board.

OBITUARIES...

Frank C. Nicholson, 66, chairman of the board of **W. H. Nicholson & Co.**, Wilkes-Barre, Pa., died Jan. 16.

Percy U. Feyler, 65, purchasing agent for **Simonds Saw & Steel Co.**, Fitchburg, Mass., died Jan. 10.

John C. MacFarlane, 64, vice president and director, **Canadian General Electric Co. Ltd.**, died Jan. 8 in Toronto, Ont.

Frank B. Andrews, 52, vice president and manager of production, **Brasco Mfg. Co.**, Harvey, Ill., died Jan. 11.

William Stewart, retired blast furnace superintendent at the Clairton, Pa., Works of **U. S. Steel Corp.**, died recently. He retired in 1945.

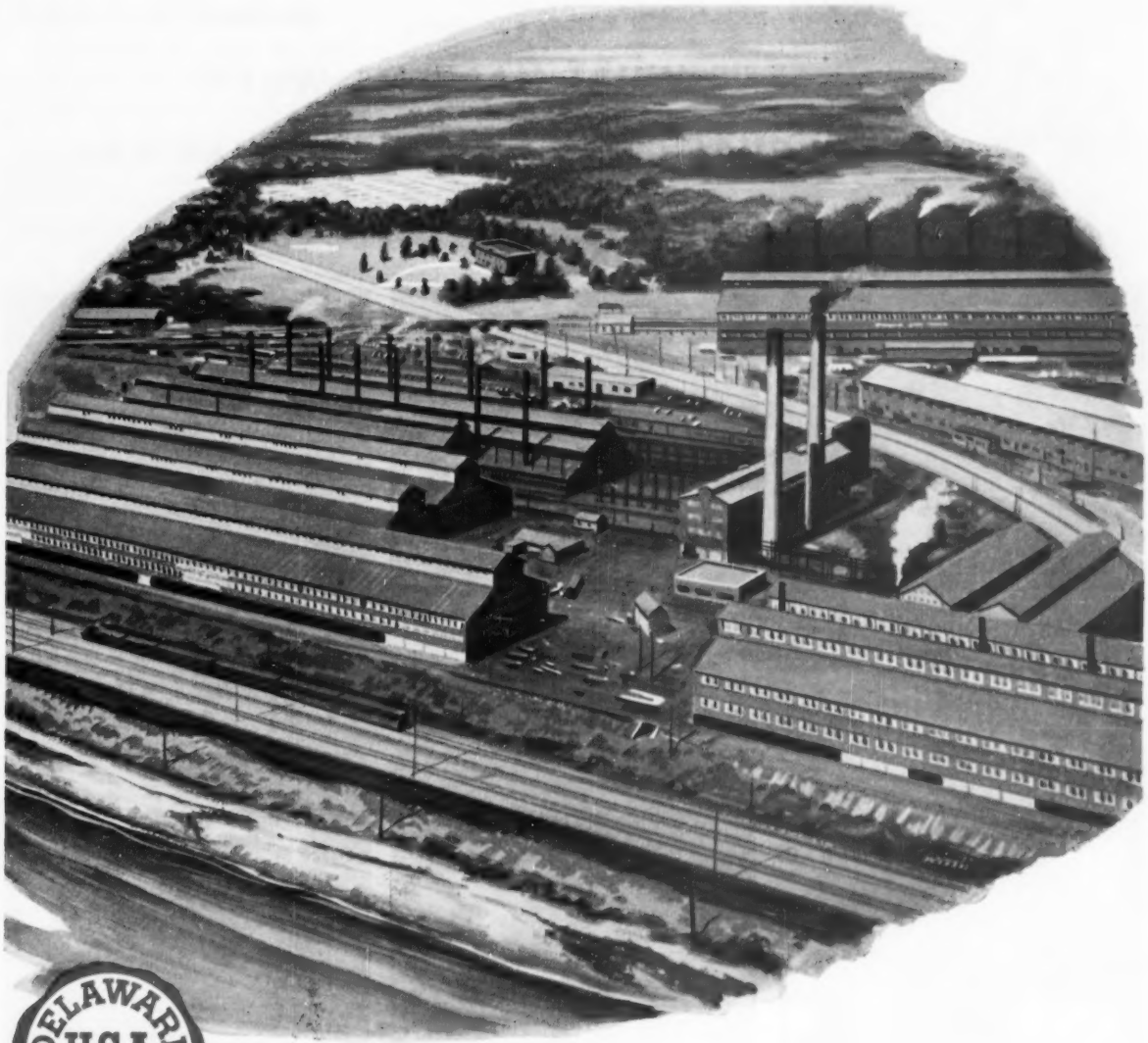
W. R. Tuttle, 66, president and general manager, **Tuttle & Kift Inc.**, Chicago, died Jan. 7.

Charles O. Burgess, 51, technical director of **Gray Iron Founders' Society**, Cleveland, died Jan. 13. Before joining the society's staff in 1948, Mr. Burgess was head of the industrial service department, research division, Union Carbide & Carbon Corp.

Frederick S. Glover, 74, former president of **Reo Motors Inc.**, Lansing, Mich., and of **Timken-Detroit Axle Co.**, Detroit, died Jan. 13.

George Gray Sr., 68, a representative of **Gleason Works**, Rochester, N. Y., died Jan. 11.

Reginald H. Hargrove, 56, president, **Texas Eastern Transmission Corp.**, Shreveport, La., died Jan. 10.



DELAWARE VALLEY U·S·A

America's fastest growing industrial area

HOME OF CLAYMONT STEEL

Here at Claymont, in the fast-expanding industrial empire on the Delaware River, are the open hearths, rolling mills, flanging shops, and pipe mill that turn out a wide variety of Claymont Products.

These include Alloy and Carbon Steel Plates . . . Stainless-Clad Plates . . . Flanged and Dished Heads . . . Manhole Fittings and Covers . . . and Large Diameter Welded Steel Pipe for transmission of oil, gas or water.

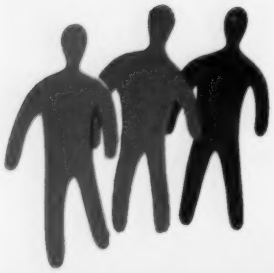
In our Claymont plant all of these products are under complete quality control starting with the making of steel in our own open hearth furnaces and continuing through every step of manufacture.

1981

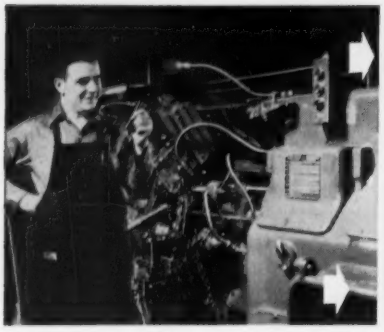
CLAYMONT STEEL

WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CLAYMONT, DELAWARE

CF&I



HERE'S WHAT HAPPENS WHEN REPUBLIC'S 3-D METALLURGICAL SERVICE GOES INTO ACTION



The field metallurgist comes right into your plant. He checks furnace temperatures and heating cycles, machines, set-ups, feeds, speeds, everything which affects your production.

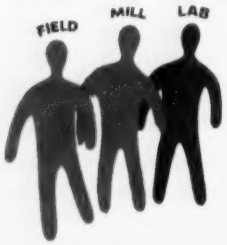
He talks to your plant and engineering people, asks questions, finds out what you want your alloy steels to do. He takes this data with him.

The Republic Field Metallurgist talks over his report with Republic's Mill Metallurgist. Experienced in producing alloy steels, he adds his knowledge, checks it against your problem. And since Republic controls its alloy steels from ore to finished product, he can trace heats of steel.

The field metallurgist next talks things over with the Republic Laboratory Metallurgist. His data on tests of alloy steels is added to the material of the field and mill metallurgist.

Then, all three men put their heads together and come up with a recommendation that is the result of pooling their findings and their experience with alloy steels. And since Republic pioneered the manufacture of alloy steels, this recommendation is based on solid data.

The Republic Field Metallurgist passes this recommendation on to your engineers and plant personnel. He works with them to see that your problem is solved satisfactorily, right in your plant. It's his job to see that you get all the advantages out of the alloy steels you use.



The results often include lower production costs, better quality, or even changes in design. You can have this free service by calling your local Republic Steel sales office.

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Alloy Steel Division • Massillon, Ohio
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Republic ALLOY STEELS

REPUBLIC STEEL

Other Republic Products Include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing.

Tapco Plans Expansion

$16-million program for 1954 includes new plants, tools and more automation projects

REFLECTING the management's confidence in the long-range economic outlook for the nation, Thompson Products Inc., Cleveland, has launched a $16-million expansion and improvement program for 1954. The proposed outlay includes some funds remaining from 1953 capital expenditures.

The program includes a new research buildng at the firm's Tapco plant in Euclid, O. Cost of the first section is estimated at $1.5 million.

A manufacturing plant will be built in St. Louis for Thompson Product's subsidiary, Ramsey Corp.

A factory will be erected in the Detroit area for the firm's Michigan operations.

Automation — Several million dollars will be expended for machine tools, automation projects and other job-making improvements in the firm's 22 operating divisions. The new automation projects will supplant line production. Introduction of several automation projects reflects a trend in industry toward use of electronically controlled equipment.

Cost of the project is "a sum equal to all of the company's estimated net profit for the year, minus modest dividends, plus the year's total depreciation allowance," says J. D. Wright, president of the automotive and aircraft parts company.

"It is significant," he adds, "that many other United States companies have adopted a similar course for 1954. For the entire nation, capital expenditures for 1954 are estimated at approximately $26 billion, only slightly less than record 1953."

Brass Firm Installs Presses

In order to lower its production costs for the manufacture of extrusions, American Brass Co., Waterbury, Conn., bought two extrusion presses from Loewy-Hydropress Inc., New York. The presses incorporate novel features guaranteeing concentric tubes and permitting a faster operating cycle than could be achieved with former designs.

Bailey Moves District Office

Bailey Meter Co., Cleveland, moved its Boston district office to 230 Congress St. The company makes industrial instruments and automatic control equipment.

Gagemaker Boosts Capacity

Cadillac Gage Co. erected a plant at 25760 Groesbeck Highway, Detroit, containing more than double the area of its old plant and providing twice the machining capacity. The plant includes a department providing chrome plating facilities, enabling the firm to step up its production even more.

Toolmaker Opens Plant

Southern Products Co. opened a plant at 8707 First Ave., Birmingham, for the manufacture of precision tools, gages, reamers, cutters and other special close tolerance equipment.

AMF Buys Chicago Firm

American Machine & Foundry Co., New York, acquired National Bowling & Billiard Corp., Chicago, bowling equipment and supply firm. National will be operated as a wholly-owned subsidiary.

Hardy Consolidates Activities

Charles Hardy Inc., New York, producer and distributor of metal powders and importer of strategic materials, consolidated its foreign sales activities with its new international sales department. E. L. Hoeflich is manager of this department and will specialize in the world-wide distribution of a selected group of machinery and industrial equipment lines.

Bliss Leases West Coast Plant

E. W. Bliss Co., Canton, O., signed a 10-year lease with Industrial Assets Co. for a manufacturing plant at San Jose, Calif. The 62,500-sq-ft factory is being equipped to manufacture and repair all Bliss products except the largest metalworking presses and rolling mills. Stocks of standard die sets and supplies manufactured by the firm's subsidiary, Die Supply Co., Cleveland, also will be maintained.

Aluminum Passes Tests

Westinghouse Electric Corp. engineers are accumulating know-how in use of aluminum especially in aluminum-wound motors. Firm also is testing use of aluminum in switchgear

Slag Association Moves

National Slag Association moved to 613 Perpetual Bldg., Washington 4.

Henry Disston Names Agent

Henry Disston & Sons Inc., Philadelphia, appointed Ira S. Latimer Co., Detroit, to represent its Steel Division in eastern Michigan and northwestern Ohio. Products handled will include tool steels, alloy and carbon bar steels, and special shapes.

British Firm To Make Belting

Hewitt-Robins Inc., Stamford, Conn., concluded an agreement with Greengate & Irwell, Manchester, England, manufacturer of conveyor belting. Under the agreement, Greengate & Irwell will manufacture to Hewitt-Robins' specifications special types of conveyor belting and other heavy-duty industrial rubber products. A

(*Please Turn to Page* 79)

Sensitive Precision Toolmaker's Lathe—10″ Model EE.

A high speed, precision lathe which will handle the majority of the turning, threading, boring and facing operations in the average toolroom.
Size: Swing over bed—12½″ • Distance between centers—20″

Precision Manufacturing Lathe—10″ Model EE.

A high speed lathe of wide adaptability for the production machining of the smaller classes of work pieces.
Size: Swing over bed—12½″ • Distance between centers—20″

The Speedi-Matic, a fast, hand screw machine.

A fast, precision hand screw machine with automatic features for handling quantities of from less than 25 to 2000 or more pieces.
Collet Capacity: ⅞″

The 13″ Model EE Precision Lathe.

The world's finest metal turning machine. Provides the ultimate in accuracy, speed and time saving convenience whether used for manufacturing operations or in the toolroom.
Size: Swing over bed—16″ • Distance between centers—30″ and 54″

Engine and Toolmaker's Lathes—Heavy Duty—13″, 16″, 20″ Series 61.

A complete range of lathes in either of two types—engine lathes for small or large lot manufacturing operations and toolmaker's lathes with that extra versatility so desirable in toolroom work. All sizes equipped with rapid traverse to both carriage and cross slide.

Sizes:

Engine and Toolmaker's Models	13″	16″	20″
Swing over bed	15⅓″	18⅓″	22⅓″
Length between centers in increments of 24″	30″-126″	30″-174″	48″-216″

For a Good Turn Faster-

Take a good look at the complete Monarch Line...

Heavy Duty Lathes—20″ M, 25″ N, 32″ NN.

For heavy duty turning, boring and facing where speed of output must be combined with high finish, close accuracy and convenience of operation.

Sizes:

	20″M	25″N	32″NN
Swing over bed	22¼″	27¼″	34¼″
Length between centers in increments of 24″	48″-288″	48″-288″	60″-324″

The Mona-Matic.

A fast, flexible, Air-Gage Tracer controlled, automatic cycle lathe with numerous cycle variations for maximum productivity on both first and second operation work.
Size: Swing over bed—15″ • Length between centers—18″, 30″, 42″

The Air-Gage Tracer.

A versatile, cost-reducing production method for turning multiple diameters and for turning, boring or facing an almost innumerable variety of contours.
Sizes: The Air-Gage Tracer can be applied to all Monarch Lathes in sizes from 10″ to 32″.

Monarch-Keller Form Turning Machines.

Standard Monarch Lathes equipped for instantaneous conversion from conventional operations to intricate form turning, boring and facing on a high production basis.
Sizes: Monarch-Keller Controls can be applied to all Monarch Lathes-sizes 16″ to 32″.

Motor-Trace Lathes.

Standard Monarch Lathes equipped for instantaneous conversion from manual to automatic cycle operation and recommended particularly for the economical production of the larger step shaft work in practically any quantity.
Sizes: Motor-Trace Controls can be applied to all Monarch 16″ and 20″ machines.

The Heavy Duty Roll-Turner.

A template controlled machine for contour turning an almost infinite variety of shapes on the face of steel mill rolls and for turning the necks during the same setup.
Sizes: Maximum roll diameter body—25″ • Distance between centers—102″ and 126″

The Shapemaster Engraver.

The machine that will reproduce any design detail which can be touched by a sharp point tool. Used widely in the making of intricate molds for the glass, plastics and mechanical rubber industries.
Size: Basically a 20″ Series 61 plus-swing Engine Lathe, unit can be converted to versatile machine with 26¼″ swing and 48″ between centers.

NOTE: Plus-swing can be furnished on all Monarch models with the exception of 10″ models and the Speedi-Matic.

Take two looks at this map...

It's Your Guide to Monarch Sales and Monarch Service

How to buy a Monarch Lathe? Simple! Get in touch with your branch office or distributor (see map above). They'll give you our full story in type and pictures—show you a sound movie of the machines—arrange for job studies, if you wish—plan a field demonstration or a visit for a factory demonstration. If you're not sure which office to contact, write us and you'll find the right man on your doorstep—quick!

How to get service for your Monarch? It's just as easy—for the Monarch service plan is second to none in speed and efficiency. Resident factory-trained service engineers are strategically located around the country. Each man travels his territory constantly, demonstrating machines, instructing operators and following installations. He'll be in your plant in a hurry any time he's wanted. Just call your Monarch branch office or distributor.

We've been able to build this topflight sales and service organization only because of the great demand for the Monarch line of proved-in-performance lathes. Challenge us to improve your performance on any turning problem! *. . . The Monarch Machine Tool Company, Sidney, Ohio.*

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

BRANCH OFFICES

CHICAGO, ILLINOIS. The Monarch Machine Tool Co., 6645 West North Ave., Oak Park, Ill.

CINCINNATI 37, OHIO
The Monarch Machine Tool Co., 7373 Brookcrest Drive, Roselawn Ctr. Bldg., Office C-17.

CLEVELAND 18, OHIO
The Monarch Machine Tool Co., 3091 Mayfield Road.

DETROIT 21, MICHIGAN. The Monarch Machine Tool Co., 16622 James Couzens Highway.

INDIANAPOLIS 5, INDIANA. The Monarch Machine Tool Co., Maco Building, Room 12, 709 East 38th St.

MONTCLAIR, NEW JERSEY. The Monarch Machine Tool Co., 484 Bloomfield Avenue.

PITTSBURGH 22, PENNSYLVANIA
The Monarch Machine Tool Co., 512 Empire Building, Liberty Ave. and Stanwix St.

DOMESTIC DISTRIBUTORS

ATLANTA 3, GEORGIA
Noland Co., Inc., 512 Spring St., N. W.

BIRMINGHAM 3, ALABAMA
Noland Co., Inc., 2204 First Ave. South.

BOISE, IDAHO
M. R. Priest & Sons, 515 Highland St.

BOSTON, MASSACHUSETTS. Wigglesworth Machinery Co., 199 Bent St., Cambridge 41, Mass.

BUFFALO, NEW YORK. G. W. Brunton and Son, Inc., 2315 Elmwood Ave., Kenmore 17, New York.

CHARLESTON, WEST VIRGINIA
Wm. S. Bolden Co., Inc., 814 East Washington St.

CHATTANOOGA 1, TENNESSEE
Noland Co., Inc., 115 Market St.

DALLAS 19, TEXAS
Greene Machinery Co., 6300 Wyche Blvd.

DAYTON 2, OHIO
C. H. Gosiger Machinery Co., Bacon & McDonough Sts.

DENVER 4, COLORADO
F. J. Leonard Co., 1219 California St., Room 201.

DURHAM, NORTH CAROLINA
George A. Marshall Machinery, 225 Monmouth Ave.

GREEN BAY, WISCONSIN
Bay Verte Machinery Company, 127-131 N. Pearl St.

HOUSTON 1, TEXAS. Steel & Machine Tool Sales Co., 6416 Navigation Blvd., P. O. Box 1716.

KANSAS CITY 6, MISSOURI
Fuchs Machinery & Supply Co., 1823 Walnut St.

LOS ANGELES 58, CALIFORNIA
Moore Machinery Company, 3876 Santa Fe Avenue.

MINNEAPOLIS 1, MINNESOTA
The John C. Elde Co., 200 Washington Ave., North.

NEW ORLEANS 6, LOUISIANA. Dixie Mill Supply Co., Inc., Tchoupitoulas & St. Joseph Sts.

OMAHA 2, NEBRASKA
Fuchs Machinery & Supply Co., Jackson at 15th St.

ORLANDO, FLORIDA
Harry P. Lau, Inc., 100 W. Livingston Ave.

PHILADELPHIA 4, PA. Machinery Associates, Inc. 325 E. Lancaster Ave., Wynnewood, Pa.

PORTLAND, OREGON. Hallidie Machinery & Equipment Co., 525 N. Tenth Street.

ROCHESTER 4, NEW YORK
G. W. Brunton & Son, Inc., 703 Temple Bldg.

ST. LOUIS 6, MISSOURI. Calcord-Wright Machinery & Supply Co., 1223-1229 North Broadway.

SALT LAKE CITY 4, UTAH
The Gallagher Company, 545 West Eighth South St.

SAN FRANCISCO 7, CALIFORNIA
Moore Machinery Company, 700 Minnesota Street.

SAN JOSE 13, CALIFORNIA
Moore Machinery Co., Porter Building.

SEATTLE 8, WASHINGTON
Hallidie Machinery Co., Inc., 210 Hudson St., South.

SHREVEPORT 93, LOUISIANA. Dixie Mill Supply Company of Shreveport, 200 Edwards Street.

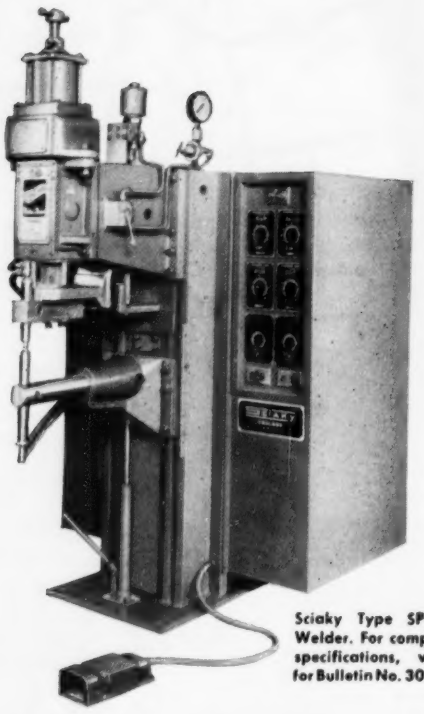
SYRACUSE 2, NEW YORK. The H. A. Smith Machinery Co., 705 Syracuse-Kemper Bldg.

TULSA 3, OKLAHOMA
Gorton-Howell Machinery Co., 215-217 East First St.

WASHINGTON 6, D. C. Shirley, Olcott & Nichols, 726 Mills Building, 17th and Pennsylvania Avenue.

WEST HARTFORD 7, CONNECTICUT
O. C. Stevens Machinery Co., Inc., 76 LaSalle Road.

STANDARD WELDER ADAPTED FOR SPECIAL APPLICATIONS



Sciaky Type SPT 2 Welder. For complete specifications, write for Bulletin No. 306-1.

Two Standard Sciaky Three-Phase Welders Join 42 Parts in 4 Operations

A short time ago Casco Products Corporation, Bridgeport, Conn., consulted Sciaky about special equipment for resistance welding simulated wire wheels for automobiles.

Power limitations at Casco were further complicated by design requirements . . . 40 spokes of .430 stainless steel joined to retainer rings . . . accurate fit on the automobile wheel demanded precise alignment of welded assembly...production rate of 1200 per day...strength to withstand vibration and shock of wheel rotation.

Avoiding the expense of special machines, Sciaky adapted two standard type SPT 2 welders with special tooling for multiple gun operation. Only four operations were required to join the 42 parts of the assembly.

Sciaky patented Three-Phase operation readily satisfied existing power facilities where conventional single phase could not. Sciaky Three-Phase, also, provided precise control to maintain tolerances of setdown and alignment.

The strength of the spot welded assembly exceeded requirements, and Sciaky Three-Phase produced a smooth fillet at weld eliminating need for special metal finishing. Production requirements were satisfied.

Write for the complete story of Casco's use of Sciaky welders for this job. Ask for "Resistance Welding at Work", Volume 3, No. 9.

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

4909 WEST 67th STREET, CHICAGO 38, ILLINOIS

Plants: Chicago • London • Paris Sales Offices: Chicago, Ill. • Buffalo, N. Y. • Cleveland, Ohio • Dayton, Ohio • Detroit, Mich. • Ft. Worth, Texas • Hollywood, Calif. • New York, N. Y. • Philadelphia, Pa. • Washington, D. C.

(*Continued from Page* 75)

new Hewitt-Robins subsidiary, Hewitt-Robins (Great Britain) Ltd., will be created to handle export sales from Great Britain. Greengate & Irwell will handle sales in the British Isles.

Ludlow-Saylor Buys Star Wire

Ludlow-Saylor Wire Cloth Co., St. Louis, acquired the assets of Star Wire Screen & Iron Works, Los Angeles. It will be operated as a subsidiary under the name of Star Wire Screen & Iron Works Inc.

Shallcross Completes Project

Shallcross Mfg. Co., Collingdale, Pa., completed a building program, including larger offices and increased production and engineering facilities. The company makes wirebound resistors, rotary selector switches, audio attenuators, and electric-electronic test equipment and assemblies.

Fahralloy Speeds Deliveries

Fahralloy Co., Harvey, Ill., manufacturer of heat-resisting alloy castings, is using an airplane to make emergency deliveries. The plane is piloted by Ted Fahrenwald, a son of the company's founder. In one particular case, this air delivery service averted a plant shutdown in Detroit where a pit-type furnace fan casting was urgently needed.

O'Brien Machinery Opens Branch

O'Brien Machinery Co., Philadelphia, opened a sales and service office at Stoney Creek Mills, Reading, Pa. The firm's Philadelphia plant has added a Foundry Division with a complete stock of new and rebuilt foundry equipment.

LeBlond Names Representative

R. K. LeBlond Machine Tool Co., Cincinnati, appointed Connell Machinery Co., Toledo, as its sales representative. The distributor offers the complete line of LeBlond lathes and lathe attachments, as well as other leading makes of machine tools.

Carboloy Expanding Plant

Program will cost in excess of $1 million, including construction and equipment

GENERAL ELECTRIC CO.'s Carboloy Department, Detroit, will complete an expansion program of over $1 million late in 1954. The program includes the addition of 36,000 sq ft of floor space to the department's metals building on E. Eight-Mile road in Detroit, plus new engineering and manufacturing equipment.

The expansion will allow the organization to rearrange its tool room production engineering and equipment development facilities and make use of 16,000 sq ft of vacated space for additional advanced engineering facilities, including a proposed new pilot plant and laboratories.

Construction is expected to start Feb. 1.

Carboloy organized three new field districts to handle its entire line of cemented carbides, permanent magnets, Hevimet and Thermistors. The new districts, headquarters and managers are: Allegheny, Pittsburgh, C. W. Powell; South Central, St. Louis, J. D. Kennedy; and New England, Boston, H. H. Jason.

Torrington Boosts Capacity

Torrington Mfg. Co., Torrington, Conn., has increased capacity for production of air-moving equipment, including fan blades and blower wheels, with the construction of a new $500,000 plant. This is the fourth Torrington expansion since 1940.

Air Conditioning Firm Expands

United States Air Conditioning Corp. more than doubled its manufacturing space with the lease of a group of industrial and office buildings on a site adjoining its existing main plant and offices on Como avenue, Minneapolis. The company's plans call for increased emphasis on its Packaged Refrigeration Division which produces self-contained central station air-conditioning equipment. packaged air-conditioning units for stores and offices, home air conditioners and window - type room air conditioners. The newly leased factory buildings will be utilized for the manufacture of coils, blowers and room air conditioners.

Screw Product Line Extended

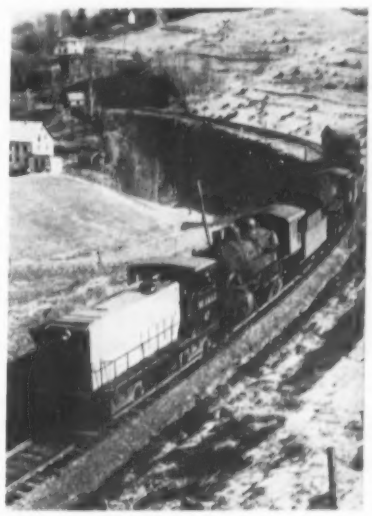
Set Screw & Mfg. Co., Bartlett, Ill., acquired from the Shakeproof Division of Illinois Tool Works, Chicago, facilities for the manufacture and sale of the line of offset self-locking set screws formerly marketed by the Shakeproof Division.

Distributor Moves Office

Nelson Equipment Distributors, franchise representative of Automatic Transportation Co., Chicago, manufacturer of electric-driven industrial trucks, moved to new headquarters at 1310 N. Capitol Ave., Indianapolis.

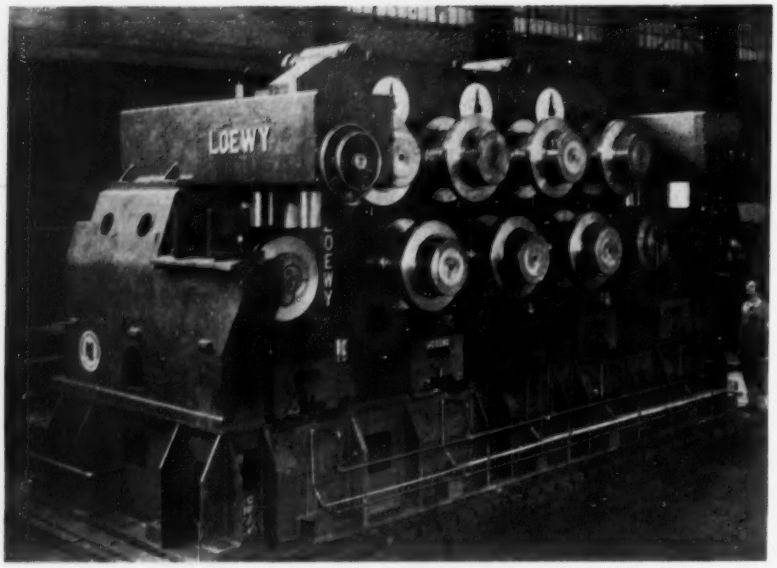
Forms Foreign Subsidiary

Jervis B. Webb Co., Detroit, conveyor manufacturer, organized Jervis B. Webb Ltd., Bexley, Kent, England. Officers of the British firm are P. L. Stonard, general manager; E. W. McCaul, chair-



The Young Leads the Old

Two steam locomotives are hauled into retirement by St. Johnsbury & Lamoille County Railroad's new Cooper-Bessemer-powered 70-ton diesel engine. Dieselization, to save substantial money in fuel and operating costs, was deemed necessary to offset the rise in costs



Roller Straightener Provides Accurate Adjustments

This straightener for rails and heavy I-beams, built by Loewy Rolling Mill Division, Hydropress Inc., New York, has seven overhung type rollers, the upper four driven by two motors. Changeover time is reduced to a minimum by the preassembled overhung rollers. Gearing is incorporated within the machine frame, eliminating a separate drive or coupling. Roller bearings are used throughout

man; J. C. Webb, managing director; and W. Morrison, secretary.

Basco Appoints Distributors

Basco Mfg. Co., Stamford, Conn., manufacturer of sheet steel separators, appointed three new distributors: Industrial Maintenance Corp., Memphis, Tenn.; Vocar Mfg. & Sales, Prospect Heights, Ill.; and Cardinal Steel Co., Cleveland.

Plans $1-Million Project

Ingalls Iron Works Co., Birmingham, is expanding its operations at a cost of about $1 million. Initial unit of the program will be an addition to its Southside plant to be used chiefly for heavy girder and truss work to take care of anticipated demand for highway improvements.

In addition, the firm will spend several hundred thousands of dollars for modernization and improvement of its Ingalls Shipbuilding Corp. plant at Pascogoula, Miss.

Burroughs Forms New Division

Growing importance of Burroughs Corp.'s electronic products has resulted in establishment of an Electronic Instruments Division as a separate manufacturing and marketing division. Announcement was made by John S. Coleman, president, at the firm's headquarters in Detroit.

Little Opens Office in West

Arthur D. Little Inc., Cambridge, Mass., is opening a regional office in San Francisco. The office will be in charge of Christian J. Matthew, assisted by Richard Newhall. The firm is active in all fields of applied science as a private research and consulting organization.

Fabricator Buys Texas Plant

Fabricated Steel Products Co., a recently formed organization, purchased the Waskom, Tex., plant of Caddo Machine Works Inc. The firm fabricates all types of steel for industrial uses.

Instrument Firm Moves Branch

CEC Instruments Inc., sales and service subsidiary of Consolidated Engineering Corp., Pasadena, Calif., opened enlarged quarters for its western regional office at 1025 E. Green St., that city. Consolidated makes analytical, measuring and recording instruments.

Hercules To Build Plant

Hercules Powder Co., Wilmington, Del., will build a $4-million plant at Burlington, N. J., with a capacity of 12 million pounds of dimethyl terephthalate a year. The product will be used in the manufacture of Terylene, a British tradename for the polyester fiber developed in England. A similar product is known in the United States as Dacron. DMT also will be used by other industries for the production of various new plastic materials.

Completion of the plant is scheduled for May, 1955, with deliveries to begin July 1 to Millhaven, Ont., site of a previously announced $20-million Terylene plant now being built by Imperial Chemical Industries of Canada Ltd., London, England.

This is the second important new industrial field to be entered by Hercules within a year. In 1953, the company began construction of an $8-million plant at Gibbstown, N. J., for the production of phenol and acetone, which is scheduled for completion in the third quarter of this year.

Tube Turns Becomes Division

Tube Turns Inc. is no longer operating as a corporation but as Tube Turns Division, National Cylinder Gas Co., Chicago. Tube Turns headquarters remain in Louisville.

Chambersburg Enlarges Plant

Chambersburg Engineering Co., Chambersburg, Pa., manufacturer of hammers and other forging equipment, is erecting a new administration building.

Vanadium Builds Mill Abroad

Operation of a new mill for concentration of eluvial and metallurgical grade chromium ore from the properties of Vanadium Corp. of America, New York, in Southern Rhodesia has been started. This firm, through its wholly-owned subsidiary, Rhodesian Vanadium Corp., owns extensive de-

self-locking fasteners

Elastic Stop nuts

HEX NUT

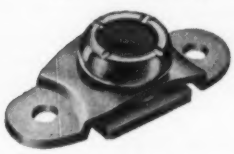
HIGH TENSILE NUT

SPLINE NUT

CLINCH NUT

1200° F. HIGH-TEMP. NUT

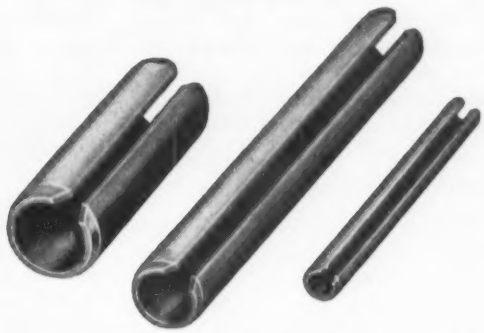
GANG CHANNEL NUTS



FLOATING ANCHOR NUT

Every major aircraft now being assembled relies on the vibration-proof holding power of ELASTIC STOP nuts. Only ESNA manufactures a complete line of all types and sizes of self-locking nuts.

Rollpins



dia. from 1/16" to 1/2"

Rollpins are slotted, tubular steel, pressed-fit pins with chamfered ends. They drive easily into holes drilled to normal tolerances, compressing as driven. Extra assembly steps like hole reaming or peening are eliminated. Rollpins *lock* in place, yet are readily removed with a punch and may be reused.

Cut assembly costs by using Rollpins as set screws, positioning dowels, clevis or hinge pins. Specify them in place of straight, serrated, tapered or cotter type pins.

ESNA TRADE MARK

ELASTIC STOP NUT CORPORATION OF AMERICA

ROLLPIN TRADEMARK

Mail Coupon for Design information

Elastic Stop Nut Corporation of America
Dept. N 34-160, 2330 Vauxhall Road, Union, N. J.

Please send me the following free fastening information:

- ☐ Elastic Stop Nut Bulletin
- ☐ Rollpin Bulletin
- ☐ AN-ESNA Conversion Chart
- ☐ Here is a drawing of our product. What fastener would you suggest?

Name_____ Title_____

Firm_____

Street_____

City_____ Zone___ State_____

posits of chrome ore in the Dyke region of Southern Rhodesia. From this ore, Vanadian Corp. manufactures ferrochromium and chrome-silicon alloys at its plants in Niagara Falls, N. Y., and Graham, W. Va.

Builds Scrap Processing Plant

Luria Engineering Co., Bethlehem, Pa., is constructing a nonferrous, iron and steel scrap plant in Kenilworth, Md., for Joseph Smith & Sons Inc., Washington. The plant will be two and one-half times the size of the present one, which the firm is vacating.

Sightmaster Buys Fuse Line

Sightmaster Corp., New Rochelle, N. Y., manufacturer of electronic products and parts for the television-radio industry, acquired the complete fuse operation of General Fuse Co., South River, N. J.

Hewson Appoints Distributors

Hewson Co. Inc., Newark, N. J., appointed as distributors for its products Fred A. Pease, Denver, and Harris-Hanson Co., St. Louis. The company makes high-voltage insulation test sets and power supplies, high-speed static control systems.

Kaiser-Nelson Enlarges Plant

Kaiser-Nelson Co., Cleveland, producer and distributor of sand and gravel and industrial steel reclaiming contractor for the steel industry, expanded its office and plant facilities at 6272 Canal Rd., Cuyahoga Heights, O.

Towmotor Gets Foreign Outlet

Towmotor Corp., Cleveland, manufacturer of fork lift trucks and industrial tractors, signed a contract with Brodrene Vestergaard, Copenhagen, Denmark, which will give it production and distribution facilities in the Scandinavian countries and continental Europe. The Vestergaard organization is a leading manufacturer and distributor of industrial supplies in Europe.

GE Enlarges Facilities

Operations in fields of radioactivity and radiation widen. Another project completed

GENERAL ELECTRIC CO., Schenectady, N. Y., is constructing a laboratory in that city to help house its expanding activities in the fields of radioactivity and radiation. The facility, a part of the general engineering laboratory, will occupy a former factory building on the perimeter of the main plant. Conversion of the building will cost $300,000.

Some of the activities planned are application of radioactive isotopes to the solution of various industrial problems; development, testing and application of various types of particle accelerators; studies of radiation damage; development of radiation shielding techniques; development of neutron activation analysis techniques; and calibration of various radiation instruments.

Equipment presently planned includes an accelerator neutron source, several isotope radiation sources, remote handling devices, and associated radiation measuring equipment.

Test Plant—As part of a major project, the company conducted initial tests at its new $1-million addition to its plant near Johnson City, N. Y. The new facility will be used for environmental controlled testing of aircraft armament systems which the company builds for Air Force bombers.

Special equipment installed in the building is designed to simulate as closely as possible actual conditions encountered by airplanes in flight. "With this equipment, we can provide the extremely high or low temperature conditions under which the systems may have to operate to defend against fighter attacks from any angle," says F. B. Law, general manager of the company's Aircraft Products Department.

Demonstrates German Equipment

Carl Hirschmann Co. Inc., Manhasset, N. Y., will devote the month of February to a special introductory demonstration of the performance of automatic equipment produced in West Germany for making precision patterns for a variety of quantity manufacturing purposes. The equipment is manufactured by Nassovia Maschinen - fabrik Hanns Fickert G.M.B.H., Langen bei Frankfurt Am Main, Germany. The eastern demonstration will be held, beginning Feb. 2, at 651 Middleneck Road, Great Neck, Long Island, N. Y. Subsequent demonstrations will take place in Chicago and Los Angeles.

Will Make Cutting Tools

Herman Williams Co., Birmingham, acquired the entire property of Alabama Paint Co. in that city and is installing special machinery and equipment for the production of tungsten carbide cutting tools.

Offers Torque Converters

Hydra-Drives Inc. was organized in Tulsa, Okla., for the sale and service of torque converters. The firm was appointed sales and service representative for Schneider Mfg. Corp., Muncie, Ind., pioneer in the field of torque converters, and Torcon Corp., Chagrin Falls, O., manufacturer of heavy-duty torque converters.

Ruud Mfg. To Move Offices

Ruud Mfg. Co., Pittsburgh, will move its general offices to Kalamazoo, Mich. The transfer is dependent on the completion of new office facilities which should be available late in 1954. The company manufactures gas water heaters and heating appliances.

Udylite Opens Warehouse

Udylite Corp., Detroit, opened a warehouse at 5203 Martin Ave., that city. It is stocked with plating and finishing supplies.

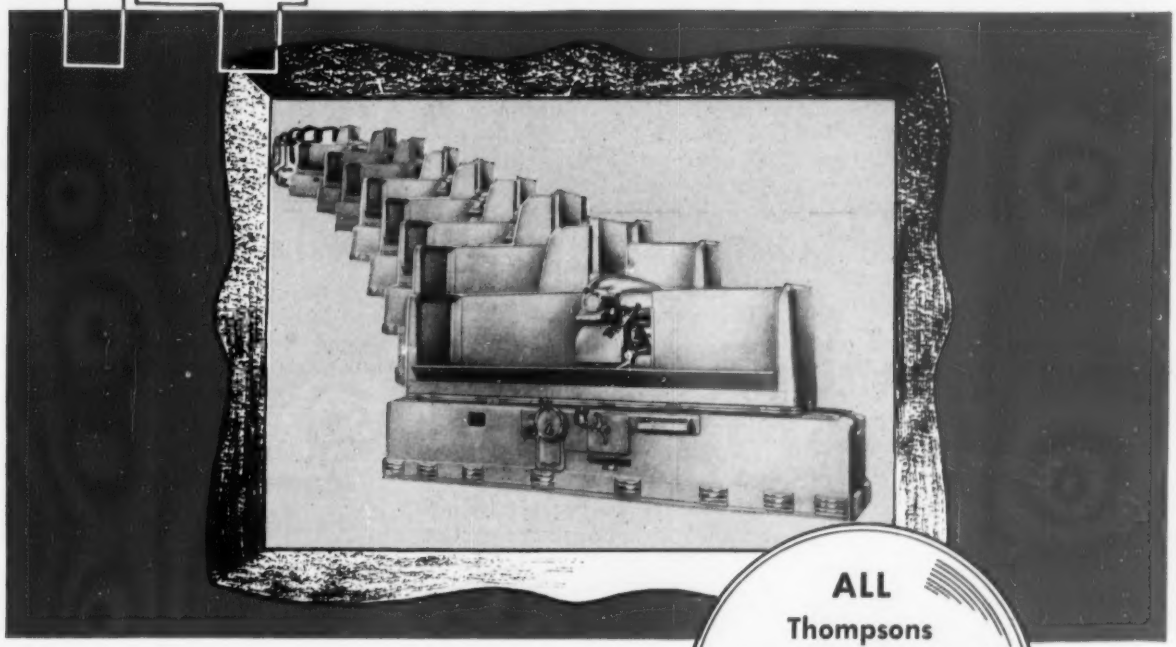
Kidde Forms Subsidiary

Walter Kidde & Co. Inc., Belleville, N. J., organized a subsidiary, Walter Kidde de Mexico, S.A., Mexico City, Mexico. The subsidiary will assemble, charge, test, paint and ship Kidde fire extinguishers to Mexican distributors; will maintain repair and recharging facilities; and will service the company's industrial fire detection

LOOK CLOSELY AT THIS PICTURE
OF GRINDER PRODUCTION AND SEE WHY...

14 *is a lucky number*

for a manufacturer requiring precision grinding



ALL Thompsons operated continuously with much LESS DOWNTIME

that's why

it will pay you to invest in

Thompson Grinders

After twelve years continuous manufacture of precision ground products, ten Thompson Surface Grinders proved so efficient and economical that this manufacturer ordered four more machines.

Thompson Grinders are available in a wide range of types and sizes from 6" x 18" to 72" x 384" to meet all production, special or tool room grinding requirements. The Thompson line includes machines from giant Hydrial Way Grinders to automatic Truform Jet Blade Contour Grinders, Dual Rotary Grinders and Broach Grinders.

CONTACT THOMPSON TODAY FOR HELP WITH YOUR MACHINING PROBLEMS

THE THOMPSON GRINDER COMPANY
Springfield, Ohio

and extinguishing systems. John F. Kidde is president of the subsidiary; Carey H. Nelson, vice president and general manager.

Chicago Bridge Expands

Chicago Bridge & Iron Co., Chicago, is enlarging its main pressure vessel plant in Birmingham and is constructing a new erection warehouse in that city. Full details of the expansion program have not been revealed, but an entirely new product may be produced in the Birmingham plant.

Warner Names Distributor

Warner Electric Brake & Clutch Co., Beloit, Wis., appointed Quinn & McGill Motor Supply Co., Denver, as distributor of its electric brakes for commercial trailers in that territory.

Buys Heating Equipment Firm

Roberts-Gordon Appliance Corp., Buffalo, manufacturer of heating equipment, acquired Pittsburgh Water Heater Co. of Canada, Grimsby, Ont. A new corporation, Pittsburgh Water Heater Co. of Canada Ltd., with capital of $200,000 has been formed to operate the Canadian firm.

Small Motors Drive Pumps

These dc aircraft motors, built by Westinghouse Electric Corp., Pittsburgh, are only 5.25 in. in diameter and weigh 37.25 lb, but deliver 3.75 hp at 42,000 ft. They will drive booster pumps for hydraulically operated controls of large military airplanes

Regulator Firm Opens Office

Electric Regulator Corp., Norwalk, Conn., opened a field engineering office in Chicago. A. W. Siff is manager of the new office.

Precision Drawn Steel Expands

Precision Drawn Steel Co., Camden, N. J., just completed the fifth plant addition in about as many years. This latest extension covers about 20,000 sq ft, bringing total for the plant up to 142,000 sq ft.

New facilities will include Medart straightening and polishing machines for producing large diameter rounds, Medart bar turning machines with a maximum capacity of 6-1/8-in. rounds and a Medart straightening machine for straightening flats, hexagons and squares.

Also included are an 18-in. Marvel saw and an additional No. 3 Cincinnati centerless grinding machine to produce turned, ground and polished steel bars of large diameters.

Automatic feed tables have been installed to provide more efficient and easier operation. A Shepard-Niles overhead crane will be used to handle the material in process.

Rodenbaugh Heads Institute

E. M. Rodenbaugh, president, National Metal Products Co., Pittsburgh, was elected president of Weatherstrip Research Institute, Riverside, Ill.

Machinery Distributor Moves

Machinery Division of Dravo Corp., Pittsburgh, moved its Cleveland office to 4207 Chester Ave. This office, under Walter R. Hoffman, district manager, handles the sale of Dravo's unit heaters; crane cab cooling and pulpit air-conditioning equipment; fabricated piping and construction services.

The office also serves as manufacturers' representative for De Laval Steam Turbine Co., East Trenton, N. J.; Cochrane Corp., Philadelphia; C. H. Wheeler Mfg. Co., Philadelphia; Fuller Co., Catasauqua, Pa.; Cleaver-Brooks Co., Milwaukee; Oxy-Catalyst Inc., Wayne, Pa.; and Walker Process Equipment Inc.

Forms Colonial Western Broach

Colonial Broach Co., Detroit, established a West Coast manufacturing affiliate, Colonial Western Broach Co., Los Angeles, in cooperation with Demco Tool Co. Inc., Los Angeles. Construction of the plant has been completed and manufacturing equipment installed. Colonial Western will manufacture broaches, broaching fixtures, and gages. Operations of the western company are under the direction of Peter Starman, manager, who also is president of Demco Tool.

Offers Finishing Service

Washburn-Pleasance Inc. was organized in Youngstown and has set up a plant to provide special finishes for steel. The firm operates exclusively on a service basis.

Gearmaker Appoints Agent

Cone-Drive Gears Division, Michigan Tool Co., Detroit, appointed Transmission Engineering Co. Inc., Philadelphia, as sales engineer to original equipment manufacturers in that district.

Blaw-Knox Gets Piping Orders

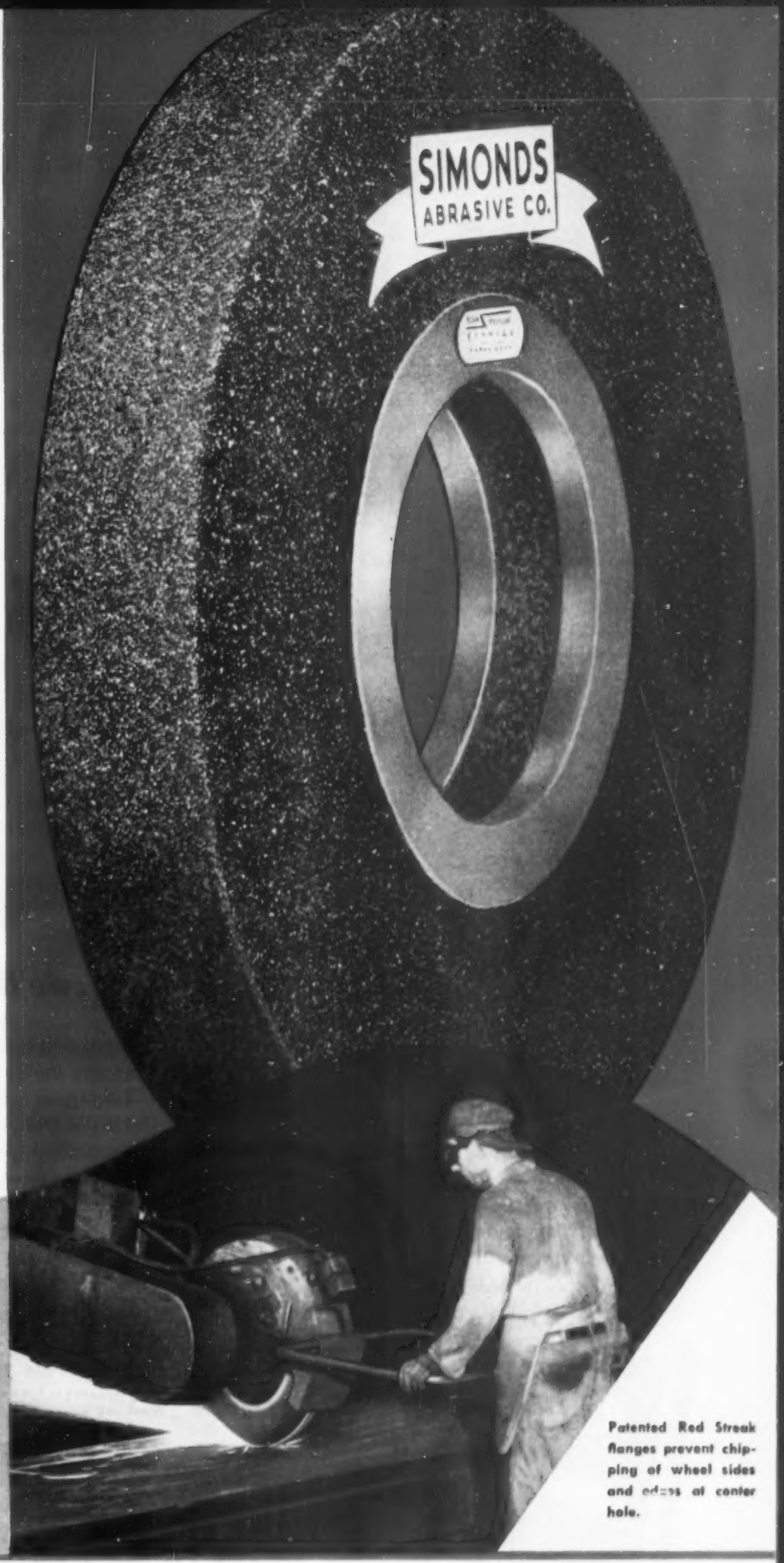
Reflecting increased demand for electric power in the South, Blaw-Knox Co., Pittsburgh, received two piping orders totaling about $5.6 million from Tennessee Valley Authority. The more recent contract amounts to $2.6 million and covers piping to be fabricated for and installed at TVA's Gallatin, Tenn., steam power station. This station will have two 25,000-kw generators. Field erection will begin early in 1955 and should be completed that year. The other contract, amounting to $3 million, covers piping for four 200,000-kw generators at TVA's Colbert steam power station at Pride, Ala. Field erection will begin soon and is scheduled for completion by November.

any way you look at it . . .

SIMONDS

RESINOID BONDED
GRINDING WHEELS

with
RED STREAK
FLANGES
save
money
in
high speed
snagging



Tonnage ground! Wheel cost! Wheel life! From any cost-saving angle this wheel has it. Less wear on mount centers. Better balance, truer running for exceptionally fast stock removal. A Simonds exclusive for new efficiency on high speed snagging operations. Write for bulletin ESA-62.

Patented Red Streak flanges prevent chipping of wheel sides and edges at center hole.

SIMONDS
ABRASIVE CO.

PHILADELPHIA 37, PA.

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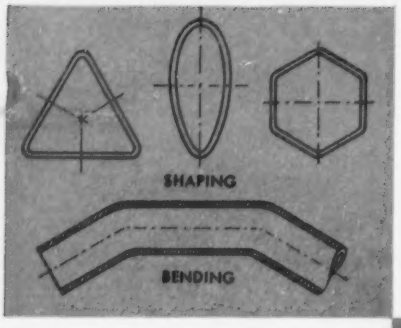
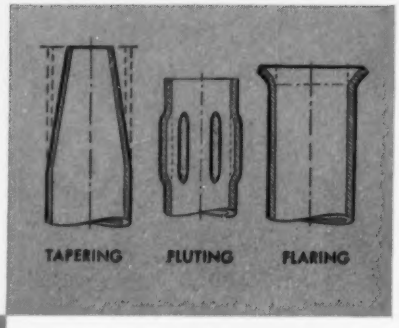


OSTUCO TUBING is versatile!



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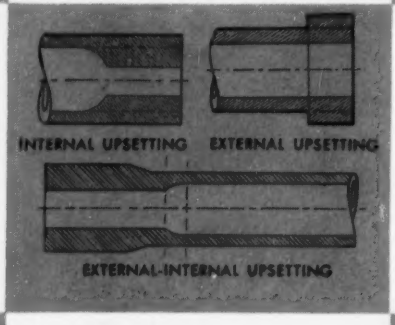

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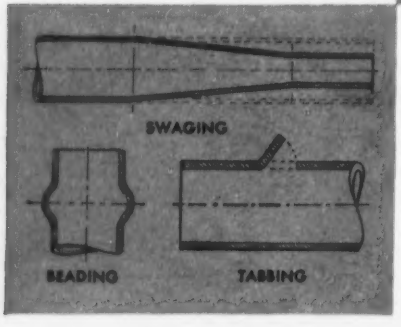

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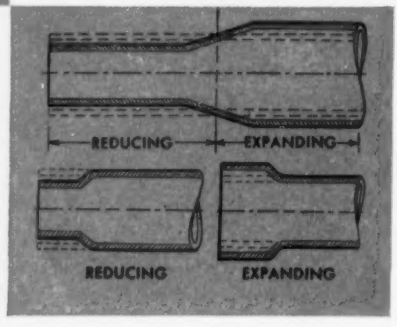

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Technical Outlook

ALUMINUM UNDER TEST— Last year Westinghouse engineers built a number of squirrel-cage motors with aluminum windings in 17 of the most common sizes. Many of the motors are being installed in company's plants for observation. No change in frame size was necessary for a given rating. Although lower conductivity of aluminum requires greater cross section than copper, aluminum is softer and packs better in the slot. Crimped-type internal connections are used instead of soldering. Evidence to date indicates performance compares with that of copper-wound motors.

QUICK SILVER—Want to put a flash of silver on parts, connections, terminals or joints without investing in plating equipment? Specialty Manufacturers and Distributors, Aurora, Ill., have the answer in a silver plating liquid that puts on a coat of silver as fast as you can swab or dip the parts. Two formulas are available, one for nonferrous metals and the other for all-purpose use.

GREENSKEEPERS' PIPE DREAM—Prominent Cleveland golf establishment has long delayed installation of fairway watering system—$75,000 cost estimate held them off. Job is now underway with plastic pipe, thanks to a $12,000 bid. Biggest savings come in labor. Since pipe need not be below the frost line, a shallow trench serves the purpose. It's another case of plastics moving into a field that metallics can't touch economically.

LOW TEMPERATURE STEELS— Cold weather performance of welded steel structures, such as bridges, ships and pipelines, depends on ductility of the metal at low temperatures. Steels with low transition temperatures are most desirable for this purpose. Hot-rolled semikilled steels are generally used. Investigating effects of varying contents of carbon and manganese on the properties of hot-rolled, semikilled steels, Battelle Institute comes up with these conclusions. Carbon raises and manganese lowers the transition temperature of the steels. Also, raising the manganese content and lowering the carbon helped maintain desirable tensile strengths.

AL-DIPPED VALVES— At least one of the major auto producers is getting ready to run a pilot operation test of aluminum coating of engine valves. Cluster of valves will get several minutes immersion in fused salt, then a quick dip in molten aluminum. Biggest bottleneck has been the device for blowing off the excess aluminum, leaving smooth, even surface. With that whipped, the process could save autobuilders a bundle by permitting them to use a less expensive alloy for valves.

LESS BOUNCE TO THE TON— That's what users of a new, anti-vibration floor pad for heavy industrial equipment are reporting. Pads are made up of layers of cork and sisal fiber impregnated with Bakelite vinyl resin, and they can take pressures up to 4000 psi without crumbling. Machines set on them require no bolting or cementing, and vibration merely causes the waffle-grid pad to grip floor more firmly. Pads are made by Clark-Cutler-McDermott Co., Franklin, Mass.

CHEAPER HEATER TUBES—If recent technical advances prove themselves, low cost air heater tubes are on the way. Glass-lined carbon steel tubing works best, but the lining process has been unwieldy and expensive. Barrows Porcelain Enamel Co., Cincinnati, has worked out special equipment to glass coat lengths of pipe up to four inches in diameter on both sides and in a continuous process. Accelerated tests indicate that problem of long term protection of tubes has been solved, too.

Metalworking Outlook—p. 39 *Market Outlook—p. 125*

Amplex

METAL POWDERS

EASE PRODUCTION HEADACHES

Measure of powder metallurgy's import for the future is the growing list of cost saving applications being made in industry today. Parts have tailor-made physical and mechanical properties

By DR. ALLEN G. GRAY
Technical Editor

A DIVIDEND - PAYING idea: That's what a manufacturer of business machines calls his use of a sintered iron powder ratchet in place of one formerly made on a milling machine.

Actual savings figure out to be 45 per cent. Sintered part is impregnated with oil to self-lubricate it for life. Investment is nil and machine shop load is lighter because ratchet is supplied by an outside maker of powder metallurgy parts. It comes ready to be installed on the machine.

Many Save—"A vastly superior product without any increase in cost" . . . these are the words of an executive of an old-line company that manufactures casters, chair controls and automobile products. He is speaking of the powder metal wheels that replaced cast iron ones in his company's line of casters.

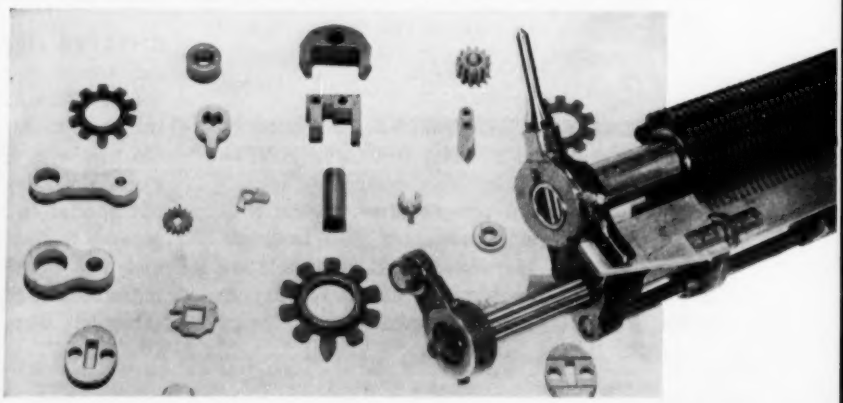
Another manufacturer reports a $20,000 annual saving on a single powder metallurgy part. One uses powder metal to save 82 per cent of the cost of a part. Company X saves seven machining operations and half its earlier cost. Company Y writes off 84 per cent of cost on a part that called for 20 hours of machining for each 100 pieces.

This is typical of the maelstrom whirling around powder metallurgy these days.

Pays Its Way—Business of making parts from metal powders has little traffic in novelties. It is a high-speed production process for making hard working parts. That means it is a cost saving process—reason enough why powder metallurgy is now an annual $200-million industry. Metal powders were used at a rate of 2,500,000 pounds a month during 1953.

Yet, it is no panacea for all metalworking problems. For many applications, powder metallurgy has nothing to offer. State of the industry today is reality. PM fabricators are the first to recognize limitations of the technique but

Typical high density iron parts produced at National Cash Register Co. Use for counter pinion (lower center) is shown in the inset



point out that where powder metal is good—it is very, very good.

Facts—A recent STEEL marketing research survey shows that 24.2 per cent of the manufacturers of machinery (except electrical) are using metal powder parts. Some 33 per cent of the manufacturers of electrical machinery use them. Among makers of transportation equipment, 26.8 per cent have metal powder parts in their products.

Only 7.7 per cent of manufacturers using metal powder parts make their own; 89.7 per cent buy them from outside fabricators; and 2.6 per cent both buy and make their parts. More than 100 fabricators are in business today.

Some 48 per cent of the plants use iron powder parts; 69 per cent brass or bronze parts; and 13 per cent use compositions other than iron, brass or bronze. Many plants reported they use more than one kind of metal powder part (which accounts for the fact that above percentages total more than 100).

Where Now?—What are future growth potentials? Spokesmen for the industry say that powder parts will be making real news in the next few years. "What's needed most is education," says one authority, "to convert engineers and designers to use powder metallurgy from the beginning. The real pay-off comes when you take advantage of all the extras the process offers."

Powder metal parts offer substantial cost savings to their users. Seemingly, the more complex a part is the more advantageously it can be made, as many machining operations can be avoided. This holds true so long as parts are designed that can be briquetted successfully—since briquetting is the crux of the process.

Principles — Engineers at Moraine Products Division, General Motors Corp., Dayton, say that practically every design limitation stems from a combination of the three fundamental limitations of the briquetting process: 1. Lack of plastic flow in powders under pressure; 2. Friction of powders on sides of die barrel and punch; 3. Mechanical limitations of tools and dies.

No Plastic Flow — Powders do not flow from a region of high compression to one of lower compression. Sharp corners and angles in the die cell that do not fill completely before pressure is applied will be lower in density after pressure is applied, resulting in structural weakness.

For the same reason, parts which involve large dimensional variations in thickness, parallel to the direction of pressure, result in serious problems in maintaining uniform density throughout.

Friction—The friction of powders on the sides of the die barrel is considerable. It influences the rate of compression along the axis of briquetting. Parts compressed from top and bottom are less dense in the middles.

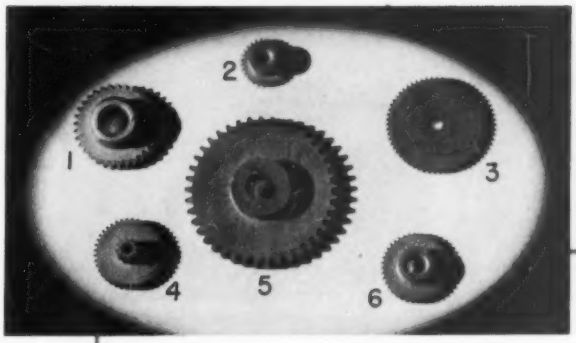
The greater the ratio of length to diameter and/or wall thickness, the more care must be exercised to obtain uniformity in density.

Tool Limitations—Pressures are most economically applied from top and bottom, not from sides. This sets certain limitations on shapes. Parts with re-entrant angles, grooves around the periphery, or complex surface configurations on a plane perpendicular to the axis of briquetting, cannot be produced without secondary machining operations.

Another mechanical limitation: Certain shapes require dies of weak design. They must be modified to eliminate feather-edges, small pins or narrow and deep splines on the die punch.

Ideal—As a general rule, parts involving axial variations of less than one fourth their lengths are naturals for briquetting. Reason: In such parts, the ratio of compression and resulting density will be sufficiently uniform without the mechanical compensation of multiple punches.

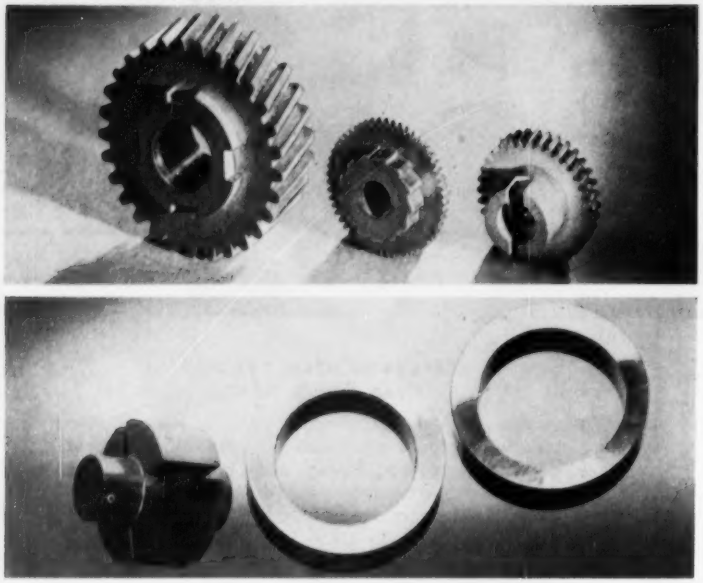
A measure of the import of pow-



GEARS FROM METAL POWDERS MEAN LOWER COST

1. Bronze powder helical gear used in electric food mixers. Cost: 10 cents—25 per cent less than cut gear formerly used. Bronze alloy has good wearing properties and works well for electric gears operated at high speeds above 10,000 rpm.
2. Small iron powder pinion gear used in gear train of fractional horsepower motor. Cost: 4 cents. Former cost: 12 cents.
3. Pinion gear used in electric fan. Cost 5 cents compared with cut gear at 10 cents.
4. Iron powder helical spur gear cluster used in electric fan. Made complete with all teeth molded in. Cost: 9 cents compared to 40 cents for former cut and assembled gear.
5. Iron powder helical gear used in washing machine. Cost: 15 cents compared with cut gear at 30 cents.
6. Iron pinion gear used in fractional horsepower motor. Cost: 5 cents.

Parts made by Yale & Towne Mfg. Co., Powdered Metal Products Div., Franklin Park, Ill.



Top: Bronze gears based on New Jersey Zinc Horse Head Brass powder. Savings average 50 to 88 per cent over previous method. Bottom: Pump parts produced by U. S. Graphite Co. from nickel-silver powder. Saving: 72 per cent over machining Monel bars. Tolerances: 0.0005-inch

der metallurgy for the future is the long list of specific accomplishments which is being compiled by fabricators. These applications show broad areas where powder metallurgy is competing with older methods of metal fabrication. Amplex Division, Chrysler Corp., Detroit, reports typical savings of 20 to 80 per cent on most machining jobs replaced with powder metal on labor and materials alone.

Tough Parts—"General practice in past was that iron powder parts are satisfactory only as a replacement for lighter duty materials," says A. J. Langhammer, president of Chrysler-Amplex. "We are now producing steel Oilite parts from iron powder so processed as to have physical properties of low carbon steel. General specifications on such parts are tensile strength of the order of 40,000 psi and elongation 10 to 15 per cent and higher if necessary."

Steel Oilite is not brittle and may be bent or twisted without breaking. Because of its high ductility and strength, it may be used for finished machine parts such as gears, cams, brackets, and lever arms formerly made from forgings and bar stock to get necessary strength.

While retaining some porosity, steel Oilite is not intended for self-lubricating applications. Uses include industrial machinery, automotive parts, home appliances, farm machinery, textile machinery, business machines and washing machines.

Close Fit — Modern techniques produce powder metal parts accurate in size to 0.001-inch, or even closer (0.0005-inch or better if needed) by coining on a conventional press after sintering. When parts come from sintering furnace they have sound physical properties and good surface finish. Parts that are sized by a coining operation have increased strength because of higher density of the part and an exceptionally smooth surface finish.

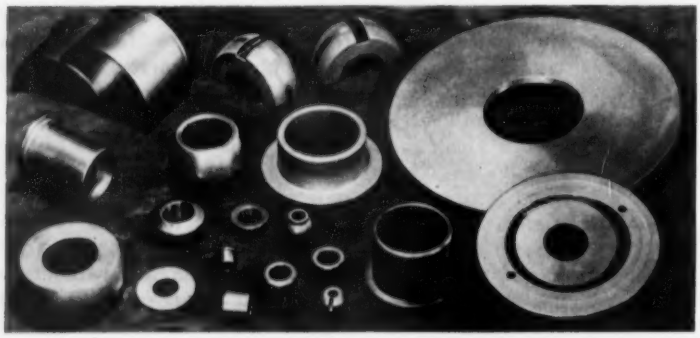
Density of metal powder parts can be controlled in a range from the relatively porous oilless bearings—which absorb and give off up to 30 to 40 per cent of their own volume of oil—to so-called high density iron parts and parts infiltrated with copper after sintering. Tensile strengths of 100,000 psi or more are obtained.

Harden—By heat treating, properties of sintered steels can be varied in much the same way as with ordinary steels. A pearlitic structure is formed in iron parts as a result of diffusion of free carbon into iron particles during sintering, followed by slow cooling.

Steel powder parts can be quench hardened and surface hardened by carburizing, cyaniding or nitriding. National Cash Register Co. has made more than 5 million counter pinions from high density iron powders. The part is carburized, hardened, tempered and the tip of a long tooth on the part is locally rehardened. Another NCR iron part is case hardened in cyanide to give a wear resistant operating surface.

Results Good—The counter pinion was one of the first powder parts put into production at National Cash Register. It is a hard working part that operates at a fast rate and must withstand high impact loads. NRC considers it the heart of one of their most complicated machines.

Tests show that after 20 million cycles (life test) the hard working pinion actually shows less wear on critical tooth areas than tolerances previously allowed on machined pinions. Dollar savings over the bar stock part have av-



Self-lubricated bronze and ferrous-base Oilite bearings

CONSIDER METAL POWDER PARTS EARLY IN DESIGN

When a new mechanism is designed or an existing one is to be redesigned, comments are often made that possibly a sintered material could be used in one or more places. Unfortunately, in a great many cases definite steps are not taken to incorporate sintered parts until after the design is frozen. Then the powdered metal people are called in for recommendations. In many cases it is found that the parts to be considered for sinterings can no longer be modified without redesign of component parts.

In the interest of saving time and money for both user and supplier of powdered metal parts J. J. Altevers, engineer at Moraine Products Div., General Motors Corp., Dayton, says that tentative designs should be submitted as soon as possible so that any changes may be made in early stages of design. Shown at right is information Moraine Products needs to make proper recommendations for use of sintered bearings.

No. Samples___ **No. Per Order**___ **Annual Usage**___
Present Material, if any___ **Part Name**___
Customer Part No. ___ **Drawing No.**___
Bearing O. D. Max. ___ Min. ___ **I. D.** Max. ___ Min. ___ **Large** Max. ___ Min. ___
Flange Dia. Max. ___ Min. ___ **Thickness** Min. ___ **Spherical Dia.** Min. ___
Corners ___
Chamfer Break Sharp Radius
Receiving Hole Dia. Max. ___ Min. ___ **Press Fit:**
Shaft Diameter Max. ___ Min. ___ **Clearance Desired:**
Finished I. D. Max. ___ Min. ___
Shaft Speed ___ **Material** ___ **Finish** ___
Temperature ___ **Load** ___ **lbs.**
Description ___
Lubricant ___
Shock, Radial, Unidirectional, Eccentric
Lubrication ___
Wick, Flooded, Vapor, Forced Feed, None
General Description of Application ___

eraged about 60 per cent.

Compare—Guiding hand behind National Cash Register's pioneering work on high density iron powder parts has been G. J. Oswald, manager, Metallurgical Laboratory. Here's how he states their case: "I will never sign my name to a blueprint calling for powder metal unless the part is equally as good as the same part made from wrought steel." When parts came in with two to three times the strength of steel NRC decided they could use them.

More than three-quarters of a million high density iron parts of some 100 different types are being turned out weekly for cash registers and business machines, and everyone at NCR feels the surface has only been scratched. Capacity is being expanded to add more high density parts from list of parts now being made by other methods. But they feel their real pay off will come as their designers get together with the plant powder metallurgy experts and actually design to use powder metallurgy.

Method—Electrolytic iron powder (99.2 purity) is used exclusively. It is purchased on specifications worked out in co-operation with Plastic Metals Division of National Radiator Co., Johnstown, Pa., the producer. Compacts are made principally on F. J. Stokes Machine Co.'s powder metal presses. Final density is over 99 per cent of the density of type 1010 sheet stock. Pressing and sintering cycle that has been worked out in general is a double press, double sinter operation.

"Physical properties of powdered metal products can be tailored to compete with a wide variety of steels depending upon the density to which a part is made and its subsequent heat treatment," says W. J. Doelker, vice president, Pow-Met Industries Inc., Dayton, specialists in production of high density sintered parts.

Physicals — Unhardened iron parts in a density range of 7.0 to 7.3 have tensile strength of 30,000 to 35,000 psi, yield strength of 22,000 to 25,000 psi and elongation of 1 to 2 per cent. Yield strength values are practically the same as tensile strength.

Iron parts produced to densities of 7.4 to 7.7 have tensile strength in the unhardened condition of 45,000 to 50,000 psi, yield strength of 28,000 to 30,000 psi, and elongation of 20 to 25 per cent. These same parts when carburized, hardened and tempered have tensile strength of 165,000 to 190,000 psi, yield strength of 150,000 to 165,000 psi and elongation of 2 to 5 per cent.

Variety—Brass powders available to fabricators of powdered metal parts include a wide range of alloys: Straight brasses ranging in copper-zinc from 70-30 to 95-5; leaded brasses, with 0.50 to 1.5 per cent lead; and special brasses containing small percentages of phosphorus, nickel, aluminum or silicon. Additional blends of powders—copper-tin, brass-iron, etc.—can be made by the fabricator.

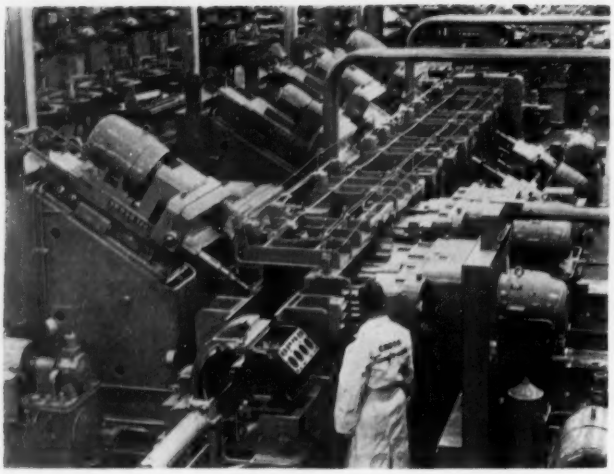
When pressed and sintered under the right conditions, brass powder parts are comparable in physical and mechanical properties to brass castings. That is, strength, hardness and wear resistance are closer to dead soft, annealed brass than to wrought parts.

One widely used brass powder is made up of 78.5 per cent copper, 20 zinc and 1.5 lead. It has a practical sintering range of 860-900° C—well within the range for commercial control. Density values of 7.4 or higher can be obtained.

Fuze—This leaded brass composition is being used for fuze components. Now in production is the M21A4 booster rotor, a small but vital non-symmetrical, cam-like part weighing about 0.8 ounce.

Powder metal fabricating plants are turning out the brass rotor blanks at a rate of about 1000 per hour per set of tools.

Saving—A detailed breakdown of cost savings behind conversion of Yale lock cylinders to sintered 78.5 per cent copper, 20 zinc and 1.5 lead Horse Head brass powder shows savings of 35 per cent in man-hours by elimination of 14 machining and finishing operations. Previous production method used sand castings. Scrap loss by powder method is minimum, and there are fewer rejects.



Automation
EYES THE FUTURE

Solution of the critical downtime problem is in the offing. Banking of parts between operations will help. As a result, automation will spread to new applications

By RALPH E. CROSS
Executive Vice President
Cross Co.
Detroit

HOW FAR will machine tool automation go in the next five years? If we can get the answer to this question today, I think it will be found by reviewing the evolution of automatic machine tools.

The word automation was coined by the automotive industry a few years ago and was defined to mean the automatic handling of parts between progressive production processes. With this definition, the application of automation starts with elimination of work handling.

As some production sage once said, "The cheapest handling is always the handling which you do not have to do." Thus automation was probably originated years ago by the man who first conceived the idea of placing two tools on a lathe carriage to cut two diameters at one time.

First Growth—From this beginning, many kinds of single-station machines using multiple and combination tooling developed. These are the machines that simultaneously perform more than one operation on a single workpiece. Examples are multiple-slide lathes, multiple-spindle drill presses, two-way, three-way and four-way drilling and boring machines, multiple spindle milling machines, etc.

Combination tools were developed to a high degree along with single-station machines. These tools are convenient for combination drilling, multiple diameter boring, form turning, milling operations and many others.

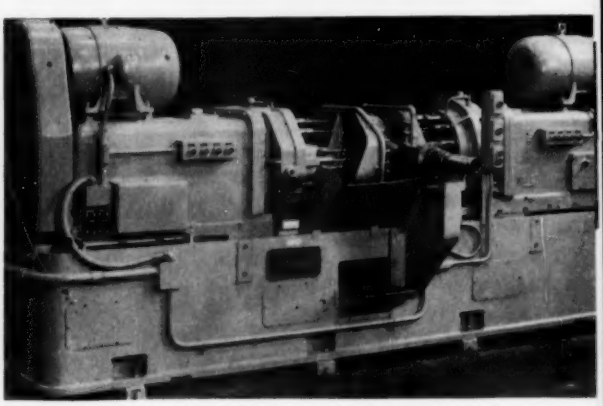
Excess — As most shop people know, single-station machines in many instances are over-extended. Some of these machines have heads coming in from all directions, and in such numbers that it is almost impossible to get the work pieces in and out of the fixtures. Changing tools is a major operation.

Such conditions led to development of the multiple station machine. First machines of this kind were the dial type and the trunnion type. In these machines workpieces are placed in fixtures which are attached to index tables or trunnions. Parts are indexed from station to station. Multiple operations are performed in each station. It is common practice in multiple station machines to set aside one station for loading and unloading the workpieces, so this time consuming operation can be performed simultaneously with the cutting in other stations.

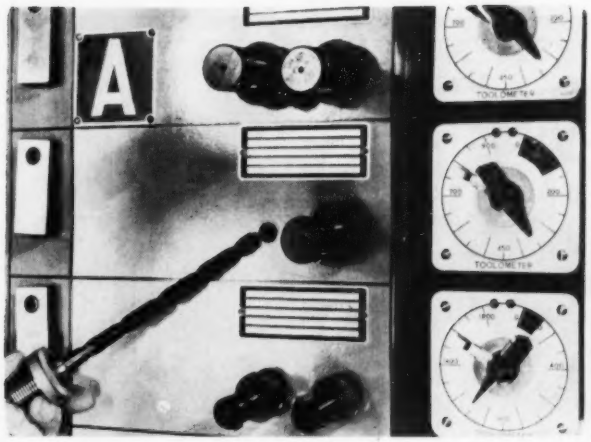
Limits—Dial and trunnion type machines bring more operations together than single-station machines, but they do not provide the whole answer. They too, have a practical limit which is the diameter of the table or the trunnion. The larger the table the greater the indexing error. Because the table size is limited, the number of stations is limited.

Demand for machines with more stations led to development of multiple station machines, wherein stations are stretched out in a straight line. These are called transfer machines and they fall into two general types, the pallet type and the plain type.

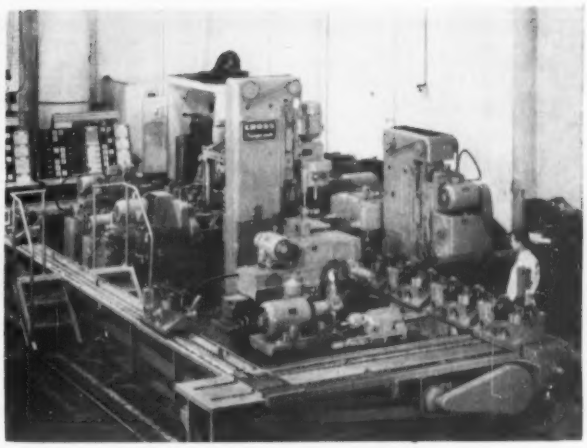
The Difference — In pallet type machines, parts are clamped in fixtures and the fixtures are transferred from station to station. After the operations are completed, the pallet fixtures return via a conveyor to the loading station where parts are unloaded and replaced with unfinished parts. Pallet machines are used where it is fre-



Automation grew from machines like multiple-spindle drill, left, to dial and trunnion-type (right) multiple-station machines. Next came the transfer units



Tool control panel holds two sets of tool replacements and counts operations to warn of impending tool failure



Plain-type transfer machine (at top page 92) and pallet-type above are examples of machine tool automation

quently necessary to change over from one part to another, also in single purpose applications where the part has an irregular shape.

In plain type transfer machines, parts are placed in the loading station, and from there they are transferred from station to station. At the end of the line they are ejected. Parts are located and clamped separately in each station.

Example — Theoretically, transfer machines offer limitless possibilities for combining operations. Machines with automatic positioning devices, cleaning, inspection and assembly operations are not uncommon today. The layout on page 94 is an example of some of our latest thinking.

This Transfer-matic is for machining V-8 cylinder blocks. It is 346 feet long, performs 539 operations, automatically handles the part in 7 different positions and has a capacity of 100 parts per hour at 100 per cent efficiency. There are 104 pieces in process at one time. Entire line is under the control of one operator.

Tool Problem—Despite the fact that there is no theoretical limit to the number of operations that can be combined into one transfer machine there is a very definite practical limit — downtime for changing tools.

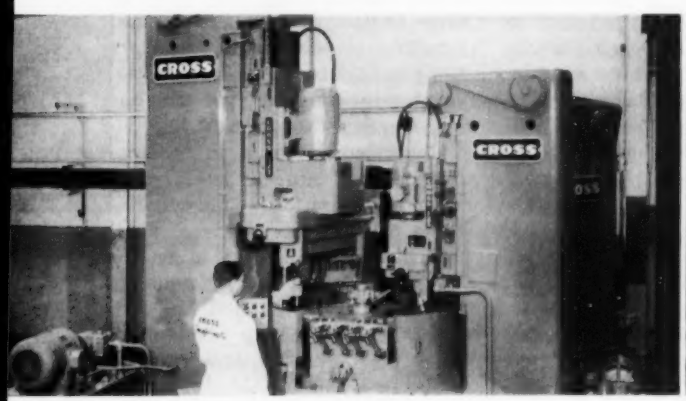
Consider a multiple station machine employing 120 tools that need changing every 4 hours. If the tool change time is 2 minutes per tool, then the total time to change all tools is 240 minutes, or 4 hours. In other words, the machine will produce for 4 hours then be down 4 hours for tool changing. If the number of tools is increased to 240, the downtime doubles; if the number is increased to 360, the downtime triples, etc.

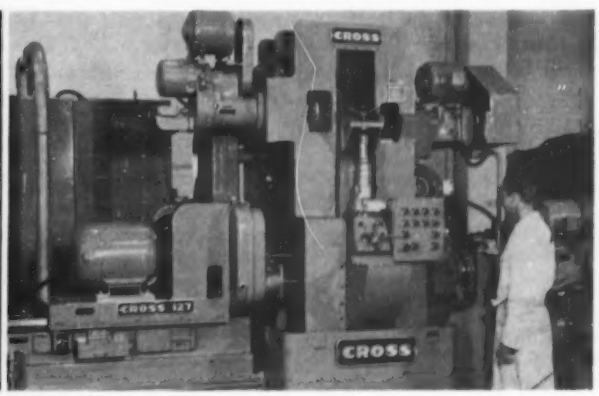
Ratio — We can deduce that downtime increases in some proportion to the number of tools in the machine. Conditions as outlined in the explanation are, of course, intolerable, and yet they are quite common today.

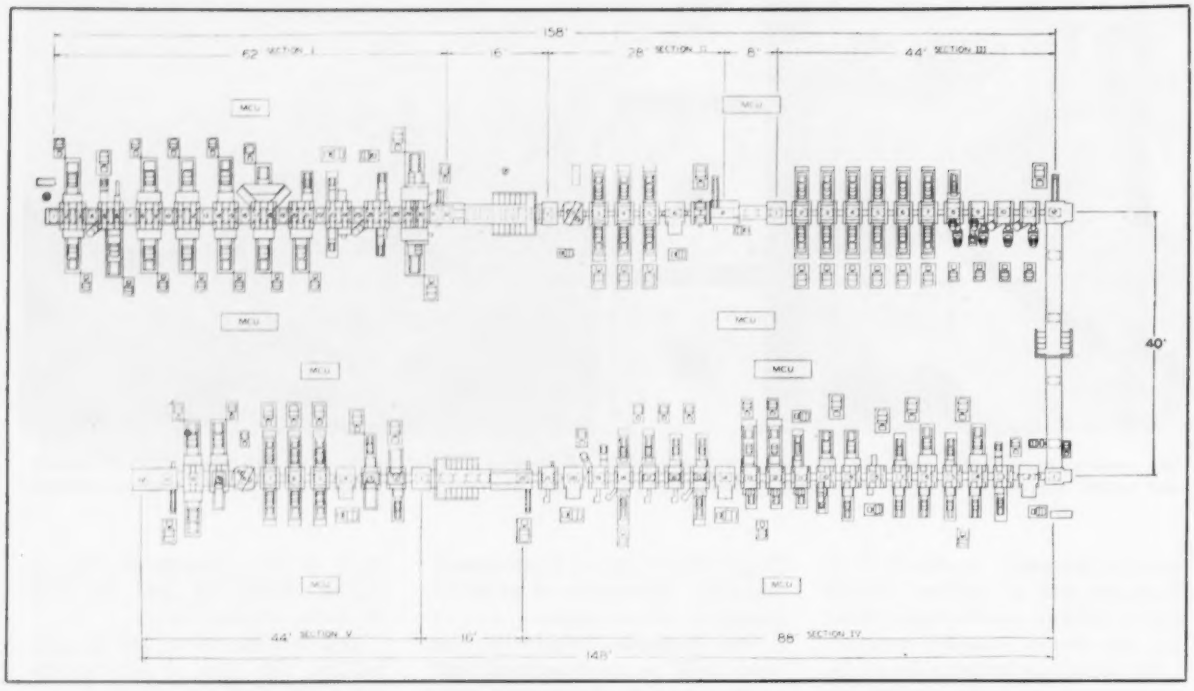
This does not mean that we have reached the limit of automation, for, as the limitation of the single-station machine led to the development of the dial type machine, and the dial led to the transfer, the present limitation of the transfer machine will lead to the solution of the downtime problem.

Solution—The problem will not be solved, as it has been in the past, by a new type of machine, but rather by automatic tool programming and the development of new automatic work-handling devices. Tool programming may be defined as the scheduling of tool operation from the time the tool is put to work in the machine until it is removed for resharpening.

Most tool programming today is under operator control. Operator places the tool in the machine and keeps a mental account of its prog-







Automation line performs 539 operations, works on 104 engine blocks at once

ress and removes it when he thinks it is dull. In larger machines, tool programming is nonexistent. Tools are put to work and forgotten about until they are broken from over-use.

Inaccessible—Need for automatic tool programming is apparent when we stop to think that tools, once under close observation in single-station machines, are now far removed from any immediate personal attention in transfer machines. Because of the inconsistency of tool performance and other variables, the first requirement of any programming device is flexibility.

Master programming of all tools in a machine or process is impractical. Too many interruptions occur to disrupt the master program, and it takes too long to develop an alternate program once there is an interruption. The solution is automatic tool programming for each individual tool.

Counter — Toolometer is a mechanical memory device that counts the number of operations a tool performs while it is working in the machine. After the tool completes its schedule of operations, Toolometer shuts down the machine for a change.

Individual tool programming in itself does not reduce downtime, but it provides the basic programming unit that can be used to keep tool-change downtime within specified limits. In the operation of the line shown in the accompanying layout, downtime is controlled and will not exceed a given number of minutes per shift. Further, lines of this character can be designed and programmed to operate with as little as 5 per cent downtime, regardless of the number of tools.

Here's how it is done. A detailed analysis is made of the time required per shift to change each tool.

Operations are then grouped and the line is divided into sections (in this case five sections) depending on the position of the part and the total time required per shift to change the tools in each section. One section, of course, will account for the greatest amount of downtime and, as a result, it will determine the line downtime.

Banking—In operation, the operator inserts the parts in station 1 of section 1 and initiates each cycle. From there on, the parts are handled automatically. Toolometers keep count of the individual tool operations. When it is time to change tools for example in section 2, Toolometers shut down this section, but all other sections keep operating.

Parts coming out of section 1 are banked up in front of section 2, and parts previously banked ahead of section 3 are fed into the line at this point. After tools have been changed and the Toolometers reset, section 2 returns to automatic operation in sequence with the rest of the line. By shutting down only one section of the line at a time, downtime for tool change does not accumulate.

New Field—This is an example of how automatic programming promotes automation, and it immediately points up the need for a new kind of work-handling device. Reference, of course, is to an automatic work-banking unit between each section to eliminate manual handling of parts while tools are being changed. Also, a similar device at the beginning of the line will displace the operator.

Continued progress in automation will lead into subassembly and assembly operation. This will create a demand for additional automatic programming to bring the component parts into the line in the proper amounts, and for additional work-handling devices to place them and assemble them in proper position.

Outstanding physicals recommend the A. O. Smith SW-65

low-hydrogen electrode

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Its better manipulation, lack of spatter, easy re-strike, quick cleaning slag and fine appearing bead make it an operator's favorite from the very first trial.

With SW-65, you have the exceptional electrode for welding cold-rolled steel, re-rolled rail, high carbon, sulphur, selenium bearing steels and steels of poor weldability.

This is the electrode to use with confidence whenever there is any doubt about weldability, and where you desire high physical and x-ray quality.

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INTERNATIONAL DIVISION: MILWAUKEE 1, WISCONSIN

Costs Favor Electrics In Cold Metal Shops

That's the general conclusion of a study made by two operating experts. It assumes annual rate of over 250,000 tons in a non-integrated steel plant

IN CONTRAST with low fuel efficiency and cheap fuel in the open hearth, the electric furnace is characterized by high efficiency and expensive energy.

The larger electric furnaces, of sizes competitive with the open hearth in melting soft steel, require about 530 kwhr per ton of steel. This is equivalent to 1.8 million Btu. With 1.4 million Btu absorbed by the bath, over-all efficiency is 78 per cent, or 2.5 times the 31-per-cent efficiency of the open hearth.

Although there is some variation in the price of electric energy in different locations, it is much less variable than fuel oil. A price of 9 mills per kwhr is fairly representative of the cost to steel plants, equivalent to $2.64 per million Btu, or 4.4 times the price of fuel oil. At 1.8 million Btu per ton of steel the cost of electric energy is $4.75 per ton, or 75 per cent higher than the $2.70 open-hearth cost. The high efficiency of the electric furnace compensates for much, but not all, of the high price of electric energy.

Minimum Size—The cost of producing steel is affected by the size of the plant and the size of the melting furnaces. A steel plant with a capacity of 250,000 tons per year is about the smallest which can be competitive. For a capacity above 500,000 tons per year, an integrated steel plant with one or more blast furnaces to supply hot metal is indicated.

TABLE I—Operating Costs Per Ton Ingots

Annual Capacity of Plant	250,000 Tons		500,000 Tons	
Type of Furnace	Open Hearth	Electric	Open Hearth	Electric
Number and size of furnaces	3—150 T.	3—60 T.	4—225 T.	4—90 T.
Tons per furnace hour	11.0	11.0	16.5	17.0
MM Btu or kwhr per ton	4.8	500	4.2	500
Operating labor	$2.20	$1.80	$1.80	$1.45
Repair labor and material	1.00	1.00	0.80	0.80
Fuel or power	2.78	4.95	2.52	4.50
Electrodes	—	2.40	—	2.40
Supplies	0.40	0.40	0.40	0.40
Water, steam, power, etc.	0.50	0.50	0.50	0.50
Switching & loco. cranes	0.65	0.70	0.60	0.65
Overhead and misc.	0.60	0.80	0.50	0.70
Furnace repairs	1.80	1.50	1.60	1.30
Molds, stools and pans	1.00	1.00	1.00	1.00
Total Operating Cost	**$10.93**	**$15.05**	**$9.72**	**$13.70**

Cost comparisons between electric and open hearth furnaces made for plants of 250,000 tons and 500,000 tons per year cover the range in which the electric furnace has the best chance to compete with the open hearth.

Operating Costs—Three furnaces are about the minimum which can be operated satisfactorily in order to have flexibility of operation, and, in the case of electric furnaces, in order to reduce surges and power demand charges. Table I compares operating costs per ton of ingots for both 250,000 and 500,000-ton shops.

The figures used for tons per hour have been reached and exceeded in modern shops. Old shops frequently have inherent handicaps which prevent getting full production from the furnaces, and no attempt was made to get average figures. The figures used are conservative and well within reach in plants using up-to-date practices.

Material Costs—Table II shows the material costs for the two types of furnaces. This table is based on a charge of 30 per cent iron, 70 per cent scrap, and 89 per cent yield for the open hearth; and a charge of 8 per cent iron, 92 per cent scrap, and 92 per cent yield

From a paper presented at the Philadelphia Regional Technical meeting of the American Iron and Steel Institute by L. F. Reinartz, vice president, and H. C. Barnes, consulting engineer, Armco Steel Corp., Middletown, O.

HERE'S A REFRACTORY THAT'S CAST— LIKE A METAL

It's pure cast alumina . . . very hard, very inert, very nearly impermeable.

And, we might add, very nearly indestructible. This molten stream is over 98% alumina. As it cools, it will form tightly interlocked alpha and beta alumina crystals. This makes a hard, ivory-like structure . . . with the inherent stability of pure alumina . . . in a dense, nearly impermeable body.

It takes a temperature of 3600 F to melt this refractory. The castings are so hard (hard enough to cut glass like a diamond) that they outwear metals. And so pure that the traces of impurities total less than 0.07%—a consideration if contamination is a factor.

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TABLE II—Material Cost Per Ton of Ingots

Type of Furnace			Open Hearth	Electric
Per cent iron in charge			30	8
Per cent scrap in charge			70	92
Per cent yield			89	92
Lbs. pig iron per ton* ingots			674	174
Lbs. scrap per ton* ingots			1572	2000
Lbs. ore per ton* ingots			40	40
Lbs. burnt lime per ton* ingots			80	80
Lbs. ferroalloys per ton* ingots			12	12
Lbs. furnace refractories per ton* ingots			80	60
Pig iron	@	$56.00**	$16.82	$4.35
Scrap	@	$43.00**	30.80	38.40
Ore	@	$18.00**	0.36	0.36
Burnt lime	@	$16.00*	0.64	0.64
Ferroalloys	@	$210.00*	1.14	1.14
Furnace refractories	@	$18.00*	0.72	0.54
Total Material Cost			**$49.48**	**$45.43**

TABLE IIA—Material Cost With Cheap Scrap

Type of Furnace			Open Hearth	Electric
Pig iron	@	$56.00**	$16.82	$4.35
Scrap	@	$20.00**	14.04	17.88
Ore	@	$18.00**	0.36	0.36
Burnt lime	@	$16.00*	0.64	0.64
Ferroalloys	@	$210.00*	1.14	1.14
Furnace refractories	@	$18.00*	0.72	0.54
Total Material Cost			**$33.72**	**$24.91**

TABLE IIB—Material Cost with Cheap Pig Iron

Type of Furnace			Open Hearth	Electric
Pig iron	@	$36.00**	$10.81	$2.80
Scrap	@	$43.00**	30.80	38.40
Ore	@	$18.00**	0.36	0.36
Burnt lime	@	$16.00*	0.64	0.64
Ferroalloys	@	$210.00*	1.14	1.14
Furnace refractories	@	$18.00*	0.72	0.54
Total Material Cost			**$44.47**	**$43.88**

*Net tons. **Gross tons.

for the electric furnace. The prices used are 1953 prices in the Pittsburgh district.

Purchased pig iron at $56.00 per gross ton is $13.00 per ton higher than No. 2 heavy melting scrap at $43.00 per gross ton, and this penalizes the open hearth with its higher percentage of pig iron in the charge. The open hearth material cost is $4.05 per ton higher than the electric furnace, practically all of which is in the high cost of pig iron.

Scrap Varies—The price of scrap varies greatly at different times and places. In July, 1953, scrap was $20.00 per gross ton at Los Angeles and as recently as July, 1949, it was $20.00 per ton in Pittsburgh. Table IIA shows the material cost with $20.00 scrap instead of the current Pittsburgh price. This greatly reduces the material cost in both cases but increases the open-hearth excess cost to $8.81 per ton ingots.

Pittsburgh and other steel producing centers are scrap deficient areas, and under peak operations scrap is at a premium at these points. Large sections of the country have much lower scrap prices, and material costs intermediate between the two extremes of Table II and Table IIA can be obtained in plants located in these scrap surplus areas.

In integrated steel plants the hot metal and cold pig are usually charged to the steel melting furnaces at about $36.00 per ton or $20.00 less than the Pittsburgh price of purchased pig iron. Table IIB shows the material cost under these conditions. The material costs for both types of furnaces are reduced and excess open hearth cost is reduced to $0.59 per ton.

TABLE III—Installation Costs and Capital Charges

Annual Capacity of Plant	250,000 Net Tons		500,000 Net Tons	
Type of Furnace	Open Hearth	Electric	Open Hearth	Electric
Number, size of furnaces	3—150 T.	3—60 T.	4—225 T.	4—90 T.
General yard work: grading, trks., pipe lines, sewers, etc.	$1,000,000	$700,000	$1,400,000	$1,000,000
Buildings	3,800,000	1,900,000	5,500,000	2,800,000
Cranes	1,600,000	1,200,000	2,000,000	1,500,000
Furnaces and auxiliary equipment	2,600,000	1,400,000	4,200,000	2,400,000
Rolling stock, locomotives, chargingbuggies, ingot buggies, slag cars, etc.	1,000,000	700,000	1,600,000	1,200,000
Material handling, bins, conveyors, fork trucks, scales	800,000	500,000	1,000,000	800,000
Services, water, steam, air, oxygen, power	1,300,000	700,000	1,800,000	1,000,000
Total Installation Cost	**$12,100,000**	**$7,100,000**	**$17,500,000**	**$10,700,000**
Capital charges per year at 20%	**2,420,000**	**1,420,000**	**3,500,000**	**2,140,000**
Capital charges per ton ingots	**9.68**	**5.68**	**6.80**	**4.28**

TABLE IV—Cost of Ingots Per Net Ton

Annual Capacity of Plant	250,000 Net Tons		500,000 Net Tons	
Type of Furnace	Open Hearth	Electric	Open Hearth	Electric
Operating cost Table I	$10.93	$15.05	$ 9.72	$13.70
Material cost Table II	49.48	45.43	49.48	45.43
Total cost before fixed charges	60.41	60.48	59.20	59.13
Fixed charges Table III	9.68	5.68	6.80	4.28
Total cost after fixed charges	**$70.09**	**$66.16**	**$66.00**	**$63.41**
Cost With Cheap Scrap				
Operating cost Table I	$10.93	$15.05	$ 9.72	$13.70
Material cost Table IIA	33.72	24.91	33.72	24.91
Total cost before fixed charges	44.65	39.96	43.44	38.61
Fixed charges Table III	9.68	5.68	6.80	4.28
Total cost after fixed charges	**$54.33**	**$45.64**	**$50.24**	**$42.89**
Cost With Cheap Pig Iron				
Operating cost Table I	$10.93	$15.05	$ 9.72	$13.70
Material cost Table IIB	44.47	43.88	44.47	43.88
Total cost before fixed charges	55.40	58.93	54.19	57.58
Fixed charges Table III	9.69	5.68	6.80	4.28
Total cost after fixed charges	**$65.08**	**$64.61**	**$60.99**	**$61.86**

Installation Cost—The cost of steel plant equipment has gone up tremendously in recent years. The installation costs shown in Table III have been adjusted to 1953 dollars. They are based partly on actual installation costs and partly on estimates and quotations. Data available has been adjusted and modified to put four plants considered on nearly the same basis.

The cost of land and the cost of bringing tracks, power lines, water, etc. to the plant site are not included. These costs vary so much with local conditions that they are meaningless in a general estimate of this kind.

Ingot Costs—Over-all measure of open hearth versus electric furnaces is determined by the total cost of ingots. This is given in Table IV with scrap and pig iron at current Pittsburgh prices, with cheap scrap, and with cheap pig iron. The cost of ingots with Pittsburgh prices before fixed charges varies from $59.13 to $60.48 per net ton of ingot.

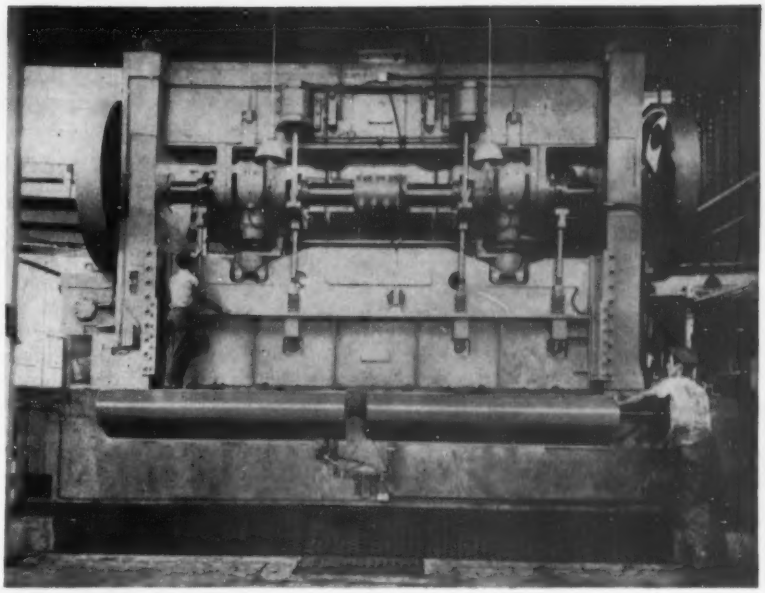
There is practically no difference in the cost of ingots from open hearth or electric furnaces with either size plant, but the cost from the small plant is about $1.25 per ton higher than from the large plant by either process. The electric furnace is $3.93 per ton cheaper in the small plant and $2.59 cheaper in the large plant than the open hearth. The large open-hearth plant is $4.09 cheaper than the small plant, and the large electric furnace plant is $2.65 cheaper than the small plant.

Some Conclusions—Price of carbon steel ingots at $59.00 Pittsburgh, is slightly less than the lowest cost listed before fixed charges and is $4.50 or more below the cost after fixed charges. The necessary conclusion is that cold metal shops of the sizes considered are not competitive with the integrated steel plants in the Pittsburgh and other steel producing districts.

The only justification for the installation of such plants in these locations would be to assure a dependable supply of ingots for rolling and processing facilities, where the profit is to be obtained from rolling and processing and not from the steel melting shop. For such conditions, electric furnaces are indicated as they give lower cost ingots after fixed charges from either size shop.

Criterion Is Scrap—With cheap scrap the electric furnace has considerable advantage over the open hearth. Before fixed charges the electric furnace is $4.69 a ton for the small shop and $4.83 for the large shop cheaper than the open hearth. After fixed charges this difference is increased to $8.69 a ton for the small shop and $7.35 for the large shop. The cost of electric furnace ingots, $45.64 a ton for the small shop and $42.89 for the large shop, leaves a margin of $3.36, or $6.11 below the Pittsburgh price of ingots, for administrative and selling expense.

With cheap pig iron, the electric furnace is at a disadvantage. Before fixed charges the cost of electric furnace ingots is $3.53 a ton higher for the small plant and $3.39 higher for the large plant than open-hearth ingots. After fixed charges the small plant has a $0.47-higher open hearth than electric furnace cost and the large plant has a $0.87-higher electric than open-hearth furnace cost. In general, an integrated steel plant with excess cheap pig iron available for additional steel melting capacity can use this to better advantage in open hearth than in electric furnaces, and it would be preferable to use this as hot metal.



From Heavy Grating to Ladies' Handbags

Penn Metal Co. Inc., Parkersburg, W. Va., constructed this machine primarily to slit and expand steel plate to form heavy, rigid grating. But, it also produces the dainty Minimesh, suitable for use in making ladies' handbags, etc. Width is 23 feet; height, 26 feet; and depth, 17 feet. With 600 tons capacity, the 200-ton machine simultaneously slits and expands solid metal sheets

A Look At Lubricants

There is little reason to doubt that in the future there will be produced new and improved lubricants, says Mr. W. W. Scheumann, manager of research, Cities Service Research & Development Co., New York, in a year-end statement.

These lubricants include hydraulic oils that are nonflammable, quenching oils that are more efficient, cutting oils that will enable better products to be produced and prolong tool life, core oils that are cheaper and more desirable than those currently used, turbine oils that have much higher oxidation resistance, and better rust preventives.

New greases are constantly appearing on the market, and a great deal of improvement can be expected in this particular field of lubrication. High temperature extreme pressure greases will be improved, all-purpose soap-base greases (high-low temperatures, water resistant) will find greater use, and because of this will be improved at lower costs.

Alliance CAR DUMPER

Rugged

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● This traveling car dumper at the Weirton, West Virginia, plant of the National Steel Corporation was built by Alliance in 1927. It has handled every carload of ore delivered to the Weirton plant since then. Designed to handle single cars, it dumps ore constantly at the rate of twenty-six cars per hour. Cars are spotted on the dumper by a locomotive.

The record of rugged dependability and economical service established at Weirton is typical of Alliance performance everywhere. Building safer, stronger and better machinery is the Alliance aim. It is our goal to make the name Alliance synonomous with quality, dependability and service.

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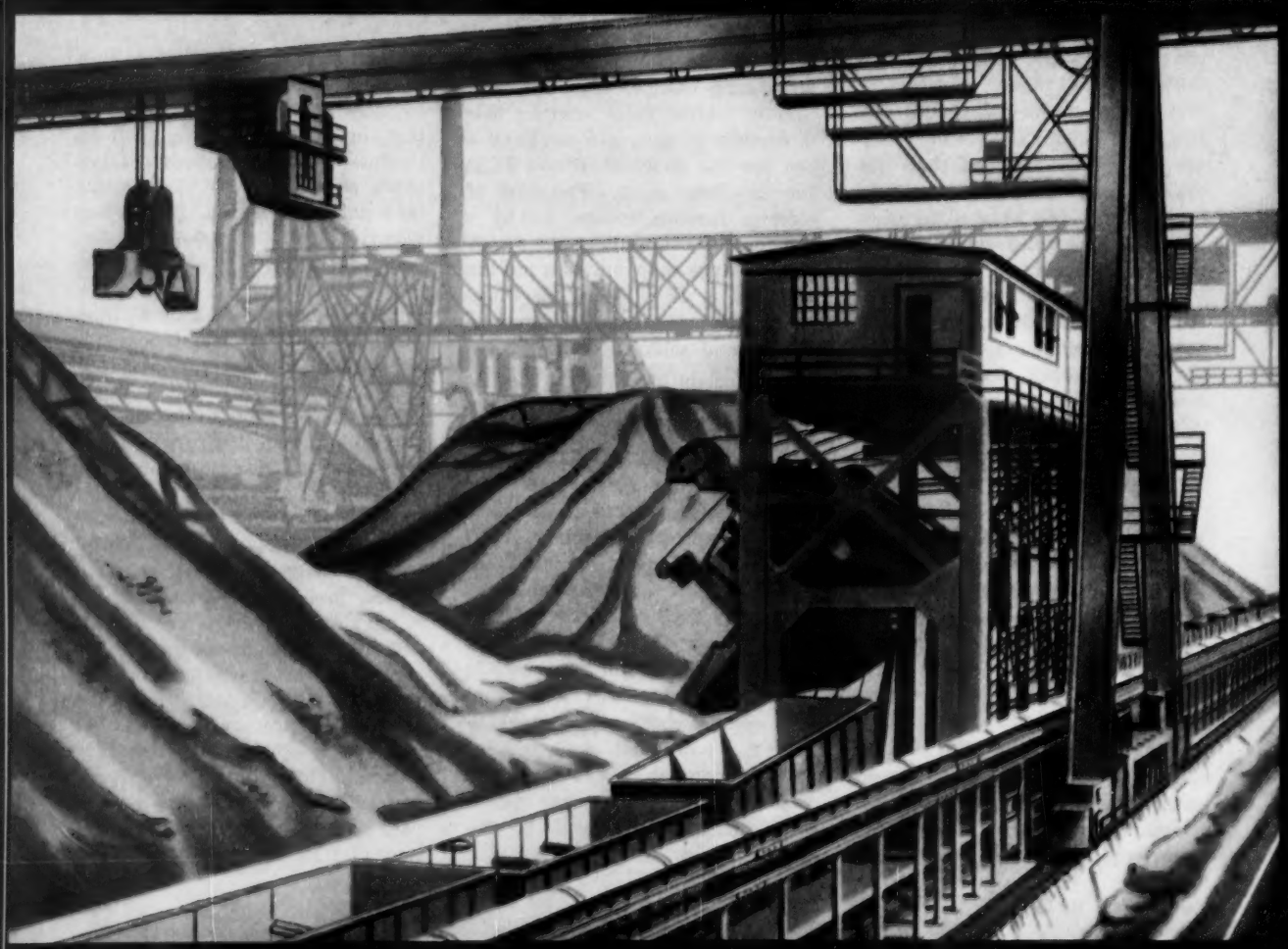


NEW PRODUCTS and equipment

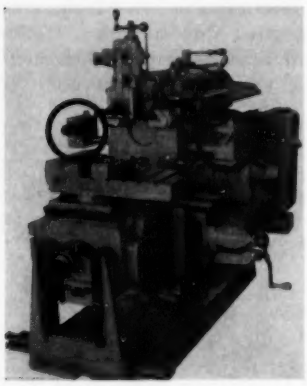
Reply card on page 103 will bring you more information on any new products and equipment in this issue

Improved Control

. . . for metalworking shapers

A dual-control is offered as an extra feature for the electro-magnetic brake and clutch on Cincinnati metalworking shapers. This additional control permits more efficient handling of large, awkward work which obstructs the operator's view from the normal working position. The clutch itself is standard equipment.

Other special features added to increase operator efficiency are



an automatic tool lifter, power downfeed to the head with automatic stop and an auxiliary front crossfeed screw. Cincinnati Shaper Co., Dept-ST, Hopple, Garrard & Elam Sts., Cincinnati 25, O.

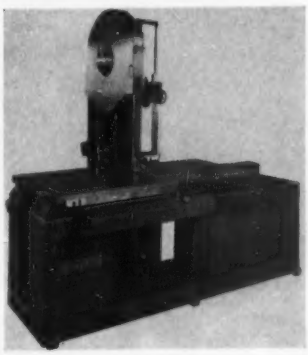
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Speed Band Saws

. . . for cumbersome cutting jobs

Tannewitz is now producing variable speed band saws equipped with hydraulically actuated tables. The machines are used in metal cutting in sizes too large or cumbersome to be readily fed by hand. Model shown is a standard size 36-inch band saw with 36-inch table, having a 0 to 6 inch per second hydraulic feed.

Rapid traverse of table to point



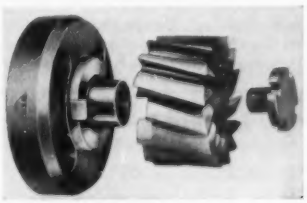
of contact between work and saw is provided to promote maximum production. Machines of this kind can be produced in practically any size to suit specific requirements. Tannewitz Works, Dept. ST, Grand Rapids, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Shell End Mill Adapter

. . . for drive milling machines

Goddard & Goddard has developed a new style quick change type shell end mill adapter standardized for #50 N.S. drive milling



machines and makes it available in two arbor sizes which fit standard shell end mill bores.

The adapter mounts directly on the front spindle flange. Standard bolt holes and key slots provide for rigid mounting and positive drive. Greater tool rigidity is provided by bolting direct to the spindle, minimizing tendency to chatter. Concentricity is assured by locating from O.D. of the spindle. Goddard & Goddard Co., Dept. ST, 12280 Burt Rd., Detroit 23, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Barrel Finishing Chips

. . . where other abrasives fail

Chicago Wheel is marketing a new precision barrel finishing chip called Novaculite. According to the manufacturer, the chips of this material have unusually long life, will reach hard-to-get-at indentations without wedging or

clogging holes and will not change the work.

Chips produce a fine finish to close tolerances, with uniform radii on edges of the work, as shown in above photo. Chicago Wheel & Mfg. Co., Dept. ST, 1101 W. Monroe St., Chicago 7, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Weight Measuring Device

. . . cuts down on moving time

Small rugged weight measuring device can be attached to boom or bridge cranes or overhead hoists having capacities up to 50,000

Presses transmit less vibration, increase floor and machine life, when mounted on UNISORB.

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You can eliminate the floor damage and time required for using bolts and lag screws — when you mount machines on UNISORB.

You reduce transmitted machine vibration 60% to 85%, depending on the type of machine. That means increased life for machines and floors. UNISORB also makes it easier to install or re-locate machines. Just cement the mounting to machine and floor.

Write for your free copy of our booklet describing UNISORB, the modern mounting pad that is also available pre-coated with adhesive for machines that don't require shimming.

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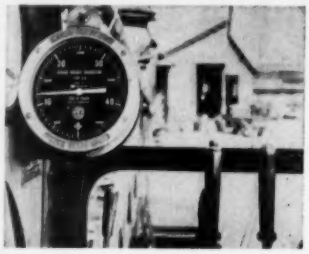
pounds. Indicator is always ready to use and eliminates the need for setting down a load, waiting for



special rigging and cuts down on time involved in moving to stationary scales.

Indicator is available in 10,000, 25,000 and 50,000-pound capacities. Installation is accomplished easily with little or no change in present equipment. Martin-Decker Corp., Dept. ST, Long Beach, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Hand Tachometer

. . . minimizes reading errors

New Metron hand tachometer is designed to minimize confusion and reading errors when measuring speeds. This is done by a

thumb operated range selector that automatically changes the scale numbers for each range. The

(Continued on p. 106)

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66. Snagging Wheels

Simonds Abrasive Co.—Copies of a brochure entitled "Abrasive Snagging Wheels for Steel Mills and Foundries" are now made available. Fused crystalline aluminum oxide and the fused crystalline silicon carbide abrasives are described. Billet, steel castings and annealed malleables, and gray iron, unannealed malleables and nonferrous casting are covered, with recommended specifications and popular wheel sizes.

67. Machine Tool Automation

Turchan Follower Machine Co.—A new 23-page catalog, Automation of Machine Tools, offers up-to-date information on ways to lower production costs and to improve production methods. The catalog covers Turchan's three divisions: Hydraulic duplicating attachments for standard machine tools; designing and building complete control systems for machines; new tracer-controlled machine tools.

68. Electric Heating

Edwin L. Wiegand Co.—"101 Ways to Apply Electric Heat" is the title of a 32-page study describing principal industrial electric heating applications and methods. Liquid, air and gas, and other types of heating are covered. A section devoted to far-infrared heating shows 28 typical uses.

69. Comparative Truck Specs

Yale & Towne Mfg. Co.—New revision of bulletin No. 5101B makes available comparative data and specifications on Yale gasoline, diesel and liquid petroleum gas-powered fork lift trucks with capacities from 1000 to 10,000 pounds. A special page is devoted to attachments available to increase versatility.

70. Air Compressors

Binks Mfg. Co.—A catalog on air compressors introduces Binks' complete line, pointing out that it now includes 27 sizes in five types. The 16-page book is useful when selecting the unit most suitable for specific requirements.

71. Abrasive Selector

Carborundum Co.—The 30-page booklet, "Coated Abrasive Selector for the Average Grinding Job," is prepared to assist in selection of correct abrasive, bond grit size and backing best suited to specific applications.

72. Shear Knife Guide

American Shear Knife Co.—Handbook calculated to provide a single source of information on use and maintenance of shear and slitter knives is available on request. Grades, recommended applications, tolerances and regrinding service are among subjects covered. Suggestion for proper care, proper grinding procedures and knife-setting recommendations are listed. 72-pages, with leather cover and spiral binding, this pocket-sized handbook is easy to use.

73. Vaporsealing Insulation

Insul-Mastic Corp. of America—Complete recommendations for vaporsealing insulation on low temperature vessels are given in this 80-page bound volume just published. The book, "Vapor and Weather Barriers for Low Temperature Insulations" contains 54 illustrations showing where and how a vaporseal coating should be applied over thermal insulation.

74. Spray Painting

DeVilbiss Co.—A sound 16 mm film, "Making the Most of the Spray Painting Method" is now available

STEEL
Penton Building, Cleveland 13, Ohio

1-25-54

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for use. Film illustrates the four basic principles of spray finishing: Proper equipment; control factors; techniques; care and maintenance of equipment. Function of basic equipment required for various spray painting operations is discussed thoroughly.

75. Electric Heat Pump

Westinghouse Electric Corp.—A 4-page bulletin describes the new all-electric heat pump. Complete explanation of heating and cooling cycles, plus schematic flow diagrams of refrigerant and air, is given. Each new feature is described and use of existing ductwork discussed.

76. On-the-Spot Electricity

D. W. Onan & Sons Inc.—A 16-page pocket-size issue of Power Points Digest describes various standby and mobile applications of the company's new model CW electric generating plant. It tells how the unit protects from effects of crippling commercial power failures and describes mobile applications.

77. Maximum Daylighting

Pittsburgh Corning Corp. — The availability of the new 24-page catalog "P.C. Glass Blocks for Industrial, Commercial, and Public Buildings" has been announced. It is designed to be used as a reference for information on physical performance; technical data on light transmission, insulation values, installation detail drawings, accessory materials.

78. Power Thread Gaging

Taft-Pierce Mfg. Co.—The bench model and flexible shaft model power head gaging units are described in 4-page catalog No. 612. A listing of various collets and adaptors now available is included for ready reference.

79. Production Report

Kaiser Metal Products Co.—How modern facilities and production know-how mean high quality and on-time delivery is detailed in a report Kaiser makes on its plant, products and engineering ability. Topics in the 15-page brochure deal with stampings, vitreous enameling, major asemblies, engineering, research and development.

80. Belt Joint Splicing

B. F. Goodrich — A 32-page, illustrated handbook on how to splice rubber transmisison belts by means of the Plylock belt joint has just been published. This belt joint is said to end separation of belts by creating a strong yet flexible joint without butted outside plies. Each step in the procedure is illustrated. Tables are included for figuring endless belt lengths and time required to vulcanize belting of various types and thicknesses.

81. Electric Power Drives

Sterling Electric Motors, Inc.—A new set of scale drawings for geared slo-speed electric power drives includes 22 separate sheets with each numbered for easy refiling. Three views of the drives are detailed on each page with the frame and type drawing to three separate scales. Drawings are adaptable to almost any drafting requirements.

82. Flexible Tubing

Pennsylvania Flexible Tubing—An 8-page, illustrated data book explains the scientific application of flexible tubing for air, oil, steam, gases and volatiles. Penflex products are catalogued and pictured and also shown in application photographs. Complete engineering data on all their tubing and couplings are given for purchasing agents, industrial designers and product engineers.

83. Automatic Scoop

Jeffrey Mfg. Co.—Bulletin No. 863 describes a new automatic power scoop designed for a one-man operation in unloading bulk material from box cars. It lists some of the outstanding features, including a deadman switch lever located on the handle grip and a free-wheeling clutch.

84. Fuel Oil Pumps

Eclipse Fuel Engineering Co.—New 2-page catalog on Eclipse Series 60 fuel oil pumps recently published. Construction, rotation and dimensions are described and accompanied by chart showing capacity variations with changes in pressure and oil viscosity.

85. Identification Signs

Ingram-Richardson Mfg. Co. — 4-page bulletin describes porcelain enamel identification signs for machinery, equipment and trucks. According to the manufacturer, surfaces of signs are not permanently affected by dirt, grease, heat and are strong and durable under all sorts of working conditions.

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86. Tool Cooling Study

Air Conversion Research Corp.—A 4-page brochure contains nine case studies of their new spray mist cooling system for cutting tools. Included also is a general discussion and description of the equipment.

EDITORIAL REPRINTS:

87. Welding Defects

An article on welding defects in STEEL is the combined effort of F. J. Feely and M. S. Northrup of Standard Oil Development Co. These experts report on how welding defects and improper repairs led to complete failure of two large storage tanks in an English refinery. In both cases, cracks propagated in a brittle manner.

88. Cold Heading

Cold heading operation is generally thought of as being synonymous with fasteners, but improvements in equipment, tooling (particularly tungsten-carbide header tools) and steels offer new engineering possibilities. According to H. C. Weidner Jr., Townsend Co., in a recent article in STEEL, if you're confining your cold heading to making fasteners, you're missing some of the possibilities.

89. Quality Control

The experience of Roylyn Inc., Glendale, Calif., during a three-week trial of random quality control sampling is related in a recent article in STEEL. Before management at this plant adopted in-process control, this system was developed. Here's how they did it.

90. More Machinable Steels

Robert F. Huber, STEEL Machine Tool Editor, says in a recent article that alloying elements improve machinability of basic steels, but leave other physicals unchanged. Dividends are paid in the machine shop as the cutter finds an easier victim. Feeling among steel men is that they can play a larger part in higher-output, lower-cost machining production by contributing steels that surrender more readily.

(continued from p. 102)

machine also eliminates the need to figure out the scale markings for each range by showing correct number of rpm per scale division.

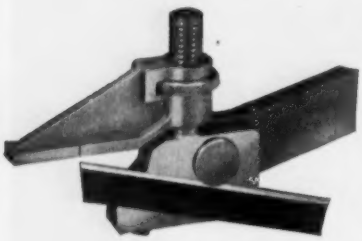
Extra-long scale is subdivided for maximum readability. Other outstanding features: Sustained high accuracy; long life; low operating torque: rapid response; permanent lubrication; rugged but light weight construction. Metron Instrument Co., Dept. ST, 432 Lincoln St., Denver 3, Colo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Redesigned Tool Holder

. . . stock cannot lift

By means of a steady-rest which holds the work down, this toolholder overcomes tendency of the



stock to lift, climb on the tool, break it and ruin the work. It functions on power cross-feed as well as hand-feed, the steady-rest being adjustable to any diameter of stock up to 2 inches by simply turning a knurled thumb-nut.

Model is designed for general tool-room and thread cutting. It is complete with a specially-designed free-cutting blade. Novi Tool & Machine Co., Dept. ST, 25806 Novi Rd., Novi, Mich.

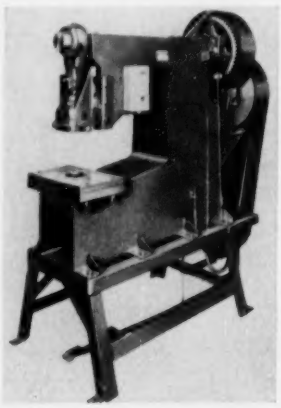
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Power Punch Press

. . . hits 84 strokes per minute

This 40-ton deep throat power punch press, added to the Whitney line, has welded steel frame, pancake type motor, heavy flywheel and gearing located at the rear of the frame. Supporting structure is mostly large angle iron, all welded for strength and solidity.

Other specifications: Depth of throat, 24 inches; height of throat, 12 inches. The press hits 84 strokes per minute, with length



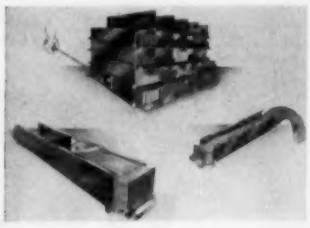
of stroke 2½ inches. Whitney Metal Tool Co., Dept. ST, 110 Forbes St., Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Wire Storage Racks

. . . instant visual inventory

New Wirack wire storage line is designed to cut wiring costs, speed assembly operation and boost production. Designed for assembly lines, these racks store wire in a compact, accessible and easy-to-see manner. They permit instantaneous visual inventory, allow greater flexibility of bench layout and an ease of selectivity previously unavailable. The racks can be



stacked as high as desired, flush at the front or at an angle. They lock one above the other and can be set up and taken down without using tools. Stackbin Corp., Dept. ST, Pawtucket, R. I.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Zinc Anode Line

. . . meets corrosion requirements

Line of seven zinc anodes meets requirements of corrosion engineers for specific types of underground or underwater installation. The new anode shapes, cast of special high grade zinc, are designed to meet majority of known applications such as pipeline, building and construction, water tank and marine. New Jersey Zinc Co., Dept. ST, 160 Front St., New York 7, N. Y.

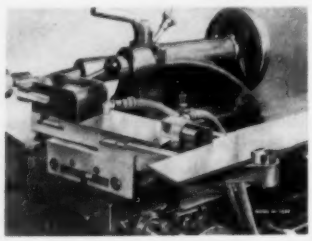
FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Profile Tracing Tool

. . . adaptable to medium lathes

Model M 1500 profile tracing tool is a simple, compact precision duplicating attachment adaptable to medium size lathes. All mechanical and easily installed, the lathe compound is removed and tracer tool mounted directly on the cross slide.

An added feature: A positive wedge lock for high production work. This permits the cross feed screw to be set in one position and



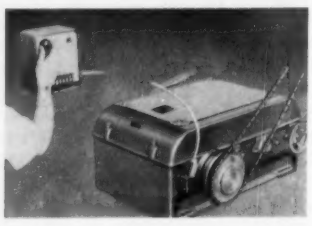
not moved while successive production pieces are machined. Air Control Division, Lehigh Foundries Inc., Dept. ST, 1500 Lehigh Dr., Easton, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

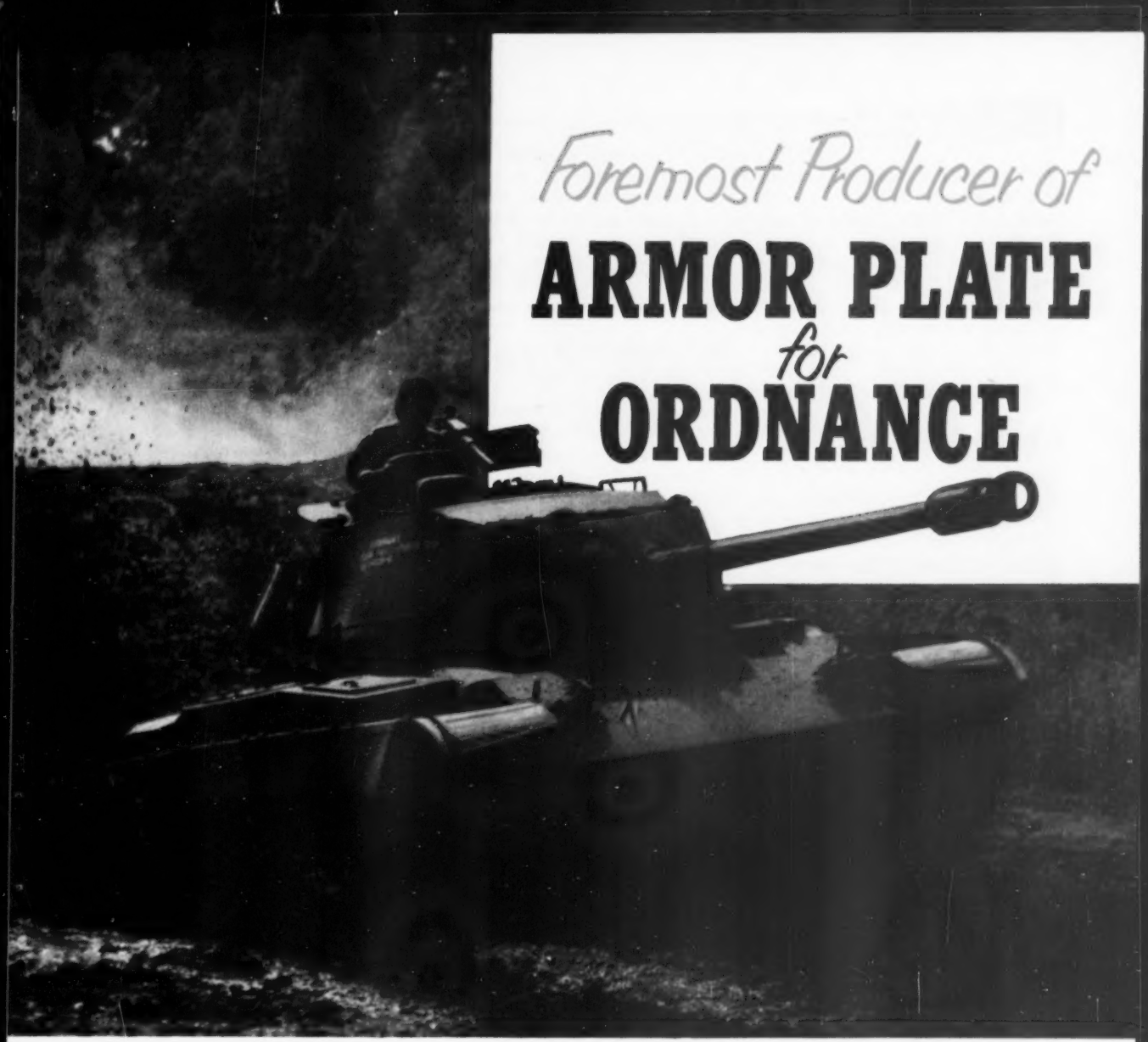
Variable Speed Transmission

. . . achieves smoother processing

A new combination of electric clutch and Reeves variable speed transmission eliminates sudden starts or stops. Result is controlled acceleration from zero to runing speed to ease handling of



fragile material and make for smooth processing of other materials. Clutch may be applied to



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ARMOR PLATE *for* ORDNANCE

Today, from central armor plate headquarters in Detroit our broad engineering and manufacturing experience is working at its highest skill producing a multitude of flat, formed, fully machined parts for tank producers.

To manufacture this armor plate we have a highly competent and efficient group of plants. We have tooled them for the most economical production. We counsel and guide in procurement, production and inspection.

As a result of this carefully coordinated program, armor plate is reaching all major tank manufacturers, *when and where it is needed.*

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Standard Steel Spring Division

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input or output shaft, depending on requirement. The rate of torque build-up is easily adjusted and controlled, automatically or manually, through a separate control panel.

An additional feature is application as a safety clutch. Reeves Pulley Co., Dept. ST, Columbus, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Adhesive-Clad-Copper

. . . expands printed circuits

A new adhesive-clad-copper process developed by Rubber & Asbestos offers bond strengths on copper-to-thermosetting sheets of up to 35 pounds per inch. This may provide the answer to many problems that have curtailed wider use of printed circuits for radio and electronic components. The adhesive, Plymaster, is supplied precoated on Anaconda electrolytic sheet copper and cut to size, with both the copper sheet and the adhesive application preinspected before packing.

In this manner, the manufacturer reports that the steps in the production of the base copper-clad-laminate for printed circuits are cut from eight operations to

two. Rubber & Asbestos Corp., Dept. P, 225 Belleville Ave., Bloomfield, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Viscous Thread Dope

. . . makes fittings re-usable

Viscous thread dope is suitable for alloy steels, nonferrous metals, plastic and ceramic threaded joints and connections. It is applicable in chemical exposures to both fluids and gases under pressure or vacuum. It seals without cementing, permits reuse of expensive alloy fittings, eliminates galled threads.

It also permits joining of dissimilar materials of construction and does not require maximum torque and pull-up on fittings for satisfactory seal. ECO Engineering, 12 New York Ave., Newark 1, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Scale-Model Truck

. . . for facts or fancy

A small working model of the Towmotor model 480-P fork lift truck has been developed to help industry plan and work out materials handling and warehousing

problems on a scale basis. The manufacturer has made this an exact replica of the One Man Gang and equipped it with many of the features of its prototype. Forks may be raised or lowered; the mast tilts; and the model rolls on rubber tires.

It is also used on desks as a paper weight and desk item. Towmotor Corp.

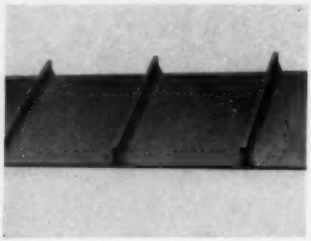
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Cleat and Belt Conveyor

. . . welded together for life

Cincinnati cleat conveyor belt is molded in one vulcanizing operation, welded together for life, causing no stress or strain when going around pulleys and allowing no gaps between cleats and belts. Maximum belt width available is 24 inches, with cleats spaced on 9, 12, 18 and 24-inch centers. Standard height of the cleat can be 1½ or 2 inches.

Advantages include: No costly shutdown time due to cleat failure; no catching of small parts under cleats; no deterioration due to oil and grease; no expense of attaching cleats or repairing them



later. According to Wright Co., it surpasses other portable conveyor types in abrasive resistance. F. B. Wright Co., Dept. ST, 1565 Oakman Blvd., Detroit 38, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Lightweight Lock Nut

. . . 45 per cent lighter

Elastic Stop Nut has introduced a lightweight, high-temperature, two-lug anchor lock nut. They report the nut is up to 45 per cent lighter than previous designs, is easier to weld and requires up to 75 per cent less critical material. Designed for service up to 1200° F and available in 8-32, 10-32 and ¼-28 thread sizes, it retains its elastic deflection characteristics at high temperatures, giving them reusable locking properties.

Silver plating process used on the nuts as a lubricant prevents

seizing and galling after high temperature service. Elastic Stop Nut Corp.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Small Rubber Tire Crane

. . . mobility over rough surface

Moto-Crane, the 6-ton model MC-104, marks Thew's re-entry into the small rubber-tire crane field. A 3-axle carrier has been incorporated in the crane. Side frames are 15 inches deep with massive front bumper and cross

These furnace operators

cut fuel costs, reduced cycle time with the LIGHTEST WEIGHT insulating firebrick

Here's "production-line" proof of actual savings made by replacing heavier brick with the lightest weight insulating firebrick made today—B&W IFB.

LARGE FORGE FURNACE
Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Furnace Output, pieces per hour	70	100	Increased 43%
Heating-Up Time, minutes	210	35	Reduced 83.3%
Cycle Time, minutes	50	30	Reduced 40%

In addition:

Fuel consumption during heating up ..... Reduced 83%
Fuel consumption during operation ..... Reduced 50%

ANNEALING FURNACE
Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Heating-Up Time, hours	52	31	Decreased 40%
Total Cycle Time, hours	131	114	Decreased 13%
Fuel Consumption, lbs./cycle	12,792	8,159	Decreased 36%
Yearly Output, tons	946	1,100	Increased 16%

MAGNESIUM MELTING CRUCIBLE FURNACE
Comparative Furnace Tests

	Ordinary Firebrick	B&W IFB	Change With B&W IFB
Fuel Consumption BTU/HR	1,000,000	500,000	Decreased 50%
Control	100 to 150 F overshoot of critical pouring temperature	no overshoot of critical pouring temperature	

What's behind these remarkable records of B&W IFB? Light weight for one—in fact B&W IFB is lighter in weight than any other insulating firebrick. This means they store and conduct less heat, provide faster heating-up time and lower fuel consumption. These brick also respond rapidly to changes in heat input, assuring excellent temperature control.

Get all the facts on B&W Insulating Firebrick from your local B&W Refractories Engineer. He may be able to point the way to lower production costs for you.

R-493

B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars

BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42ND ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.
B&W

bracing built in as a single weldment.

It is equipped with a 6-cylinder, 112-hp Ford motor and has eight forward speeds up to 45 mph and two reverse speeds. Power is applied to both rear axles to provide a 6 x 4 carrier. Rear axles

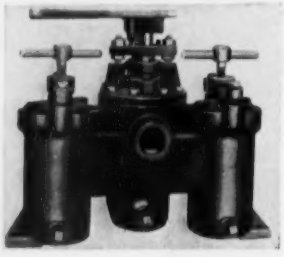
are mounted on rocker beams permitting independent movement of each axle. Thew Shovel Co., Dept. ST, Lorain, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Duplex Oil Separator

. . . coarse or fine filtration

A simplex and duplex-type oil separator for pressures up to 250 psi has filters that can be used for coarse straining or fine filtration.



Construction of the separators makes cleaning or interchanging of strainers and filters an easy matter.

A yoke-type holder at the top of the filter housing simplifies removal of various elements. Eclipse Fuel Engineering Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Barrel Finishing Compound

. . . usable on variety of metals

Multiple-purpose barrel finishing compound is said to produce brighter finishes in less time on a wide range of metals. Called Honite Multi-Burnish compound, it can be used for operations where three or four conventional compounds were previously required and with all types of barrel finishing media.

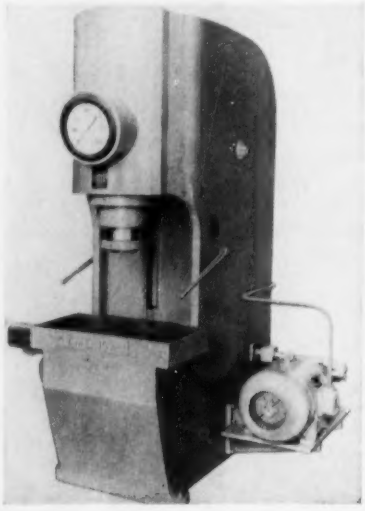
It will not break down and lose its lubricating qualities over prolonged runs and is completely soluble. Minnesota Mining & Mfg. Co., Dept. ST, 900 Fauquier St., St. Paul 6, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Hydraulic Straightener

. . . remote control adjustment

American Broach & Machine is introducing this vertical hydraulic straightening press with rapid advance, power pressing and rapid



return stroke. Manufactured in 75, 100 and 150-ton capacities, the machine can be supplied (as illustrated) with a large dial-type pressure gauge and remote control adjustment for relief valve setting.

Two pumping units in the hydraulic circuit permit rapid advance and return stroke. One is used to develop maximum pressure used for power pressing stroke. A decompression valve in the circuit automatically prevents high pressure shock when the machine ram stroke is reversed. American Broach & Machine Co.

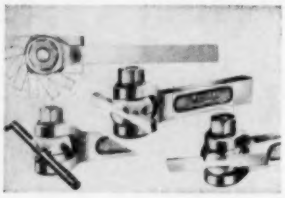
FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Multi-Angle Tool Holder

. . . swings bit to any angle

Multi-angle-position tool holder enables the machinist to swing the tool bit to any required angle. Thus, according to Seaboard Steel, the one toolholder replaces many old type holders. It takes 3/8-inch square or round toolbits, and 1/2-inch cutting-off tools.

Toolholder is drop forged from



a special steel, accurately machined, heat treated and hardened. Seaboard Steel Co. of America Inc.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Coated Welding Electrodes

. . . standardize techniques

A line of manganese-nickel steel electrodes run as easily as stainless or mild steel types. The Flo-Kote electrode will weld in all positions — overhead, vertical or down-hand and will join dissimilar metals.

It can easily be cut with an ordinary oxyacetylene flame. Stutz-Sickles Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Lightweight Power Threader

. . . weighs only 75 pounds

Oster Mfg. Co.'s lightweight power threader, the No. 142 Featherweight Champ, weighs only 75 pounds. One man can move it and use it with ease. It is available

with either gas or electric power and has threading range of 1/8-inch to 2 inches.

Spindle speed ranges from 22 to 36 rpm variable with load. Oster Mfg. Co.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

STEEL TUBING SEAMLESS, WELDED AND BUNDYWELD

ALL SIZES NOW AVAILABLE FOR IMMEDIATE DELIVERY

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We carry one of the most complete stocks of tubing in the country in our Warehouses. Manufacture is under careful control from laboratory inspection of the raw material to the finished tubing, with the result that our product is of a uniformly high quality.

In order to provide the most suitable tubular product for the desired application at the lowest possible cost, we give specialized attention to fitting the tube to the job. The knowledge gained from our experience, acquaintance with the products of different mills, and the advantages and limitations of various tubular products is available to solve your tubing problems.

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CHECKLIST FOR

A. L. SODERGREEN
Director of Research
West Disinfecting Company
Long Island City, New York

FLOORS are a major capital asset, yet industry walks all over them—literally and figuratively. During 1951, for example, industry spent an estimated $300 million on new flooring. A large percentage of this figure went for replacement. Much of this expense would have been unnecessary with proper care, and with a systematic floor maintenance program.

One reason for neglect is the highly controversial nature of the maintenance subject. Advice and opinions vary as widely as the products and claims that are presented. Resulting confusion discourages and hinders a systematic approach. All too often it serves as an excuse for doing nothing un-

GUIDE TO FLOOR MAINTENANCE—WOOD & RESILIENT FLOORING

	Cleaning	Sealing	Maintaining	Inspecting
Old Wood Floors	1. Remove wax, oil, grease and dirt. 2. Bleach stains if desired with oxalic acid solution; rinse. 3. When dry, sand if required, with proper cuts depending on floor condition. 4. Pick up all wood dust with tack rag dipped in sealer.	1. Be sure floor is clean and dry. 2. Apply thin coat of penetrating sealer; buff lightly with steel wool after 15 minutes; dry for one hour. 3. Apply thin coat of resinous sealer; dry; buff lightly and pick up residue with tack rag. 4. Apply second sealer coat; dry 10-12 hours. 5. Buff lightly if satin finish is desired.	1. Apply one or two thin coats of water-emulsion wax or maintain with deodorizing cleaner containing wax. 2. Use antiseptic dust control compound to enhance appearance and lay dust.	1. Look for dirt and imbedded foreign materials not removed in routine cleaning. Remove as soon as noticed and rewax if necessary. 2. Dull or discolored areas indicate wear of wax coating. Surface should be cleaned and rewaxed.
New Wood Floors	1. Clean thoroughly with solution of approved mild soap. 2. Sand. 3. Pick up all wood dust with tack rag dipped in sealer.	1. Follow same procedure as recommended for old floors.	1. Follow same procedure as recommended for old floors.	1. Follow same procedure as recommended for old floors.
Old Linoleum Floors	1. Remove waxes with oil-base soap; paste waxes with acceptable thinner. 2. Scrub with clear water; dry thoroughly. 3. Buff with No. 00 steel wool.	1. Seal cleaned, dry linoleum by applying heavy coat of penetrating varnish; allow 15 minutes for penetration; wipe up excess. 2. Buff with steel wool. 3. Apply second and third sealer coats, buffing with steel wool between applications.	1. Apply one or two thin coats of acceptable water emulsion wax, or maintain with deodorizing cleaner containing wax. 2. Control dust on well-waxed floors with oilbase antiseptic compound.	1. Watch for uneven surface wear; correct with protective wax coating. Clean and reseal if wear is extreme. 2. Clean and rewax dull finish. 3. Make sure routine cleaning gets all foreign materials before they become imbedded.
New Linoleum Floors	1. Clean with mild oil-saponified liquid soap, diluted according to directions. 2. Rinse with clear water and dry.	1. New linoleum has been finished by manufacturer and should not be sealed.	1. Maintain original surface with thin coats of water-emulsified wax finishes. 2. If initial waxing is impractical, maintain surface with wax cleaner. 3. Control dust with oil-base antiseptic compound.	1. Follow same procedure as recommended for old linoleum.
Asphalt Tile	1. Scrub carefully with dilutions of soluble powder cleaners of mild liquid soap. (In badly deteriorated tiles, colors may run even with plain water.) 2. Rinse and allow to dry. 3. Buff with flexible pad of No. 00 steel wool in polishing machine. 4. Pick up residue with vacuum.	1. Apply at least two thin coats of mastic sealer, designed to prevent color running from maintenance treatments. (Grease-proof asphalt should not be sealed.)	1. Apply at least two coats of water emulsion wax, buffing with No. 00 steel wool between each application. 2. Brush daily with soft hair brush. No. 00 steel wool. Clean periodically with deodorizing wax cleaner. 3. Control dust with antiseptic compound, applied by either spray or mop.	1. Follow same procedure as recommended for linoleum.

FLOOR MAINTENANCE

til a floor revamping of major proportions is unavoidable.

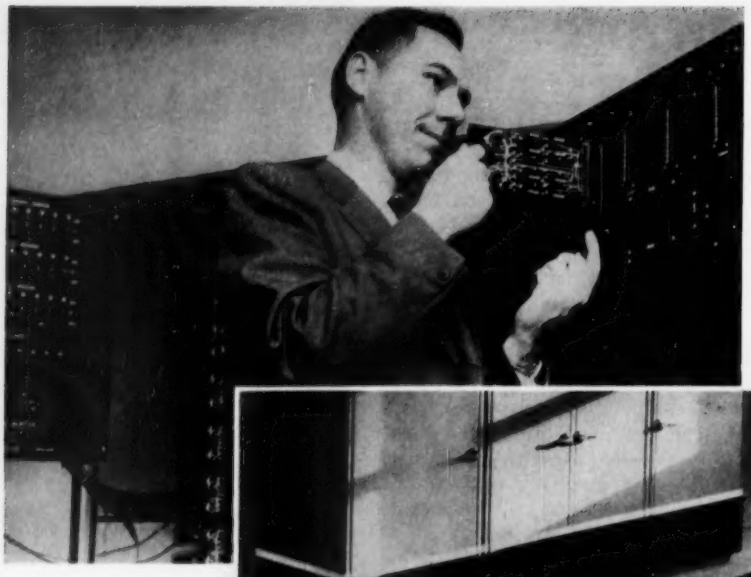
New flooring is expensive. Here, based on reports of reliable floor contractors, are typical costs:

Type of Floor	Installed Cost 50,000 sq. ft.
Asphalt Tile	$15,000
Concrete	18,000
Linoleum	21,000
Hardwood	27,000
Cork	39,000
Rubber Tile	44,000
Vinyl Tile	44,000
Ceramic Tile	65,000
Terrazzo and Mosaic	84,500
Marble	150,000

Unfortunately, there is no one product that will protect and preserve flooring in one application. However, the problem can be resolved to four fundamentals which constitute the approach to a good floor maintenance program: Cleaning, sealing, maintaining and systematic regular inspection.

Once these four essentials are adapted to a particular floor, the ground work is laid for a continuing floor maintenance program which can be followed economically. The full functional life of the floor will be assured, and the need for premature resurfacing removed.

Rubber Tile	1. Brush loose dirt. Buff old, porous rubber first with No. 00 steel wool. 2. Clean with soap or special rubber cleansers. 3. Rinse and allow to dry. 4. Buff with No. 0 steel wool.	1. Rubber tile floors should not be sealed.	1. Apply thin coat of water emulsion wax, dry until hard. 2. Buff with steel wool and repeat with second wax coat. 3. After waxing, buff systematically to reduce number of washings. 4. Control dust with antiseptic compound.	1. Follow same procedure as recommended for linoleum, except for sealing.
Cork	1. On newly installed floors, allow seven days for bonding cement to set. 2. Clean with mild scrub soap.	1. Apply two coats of penetrating varnish sealer to dry floor. Buff each coat with fine steel wool.	1. Apply at least two thin coats of water emulsion wax and buff.	1. Follow same procedure as recommended for linoleum. 2. Watch particularly for scuff marks and nicks. Reseal against heavy wear.
Cement Floors	1. Remove chemical hardeners from new cement by scrubbing and flushing with hot water. 2. Remove all wax, oil, grease, and dirt with wax removers, degreasers, soap solutions. 3. Rinse away traces of cleaners with hot water or steam. 4. Etch with muriatic acid solution; rinse several times with hot water. 5. Test for dampness; prime damp floors with an approved special primer; rinse with water; dry eight hours.	1. Treat with two thin coats of resinous sealer—pigmented or clear. Allow drying between applications. For high gloss, apply coat of clear sealer over two coats of pigmented sealer.	1. Wax with one or two coats of water-emulsion wax or maintain with deodorizing cleaner containing wax. 2. Use antiseptic dust control compound to enhance appearance and lay dust.	1. Watch for signs of dusting or powdering. These are sure signs that surface should be sealed. 2. On sealed floors, watch for chipped areas which should be resealed. 3. Make sure routine cleaning is removing all foreign materials. 4. Sealed floors which become dull should be rewaxed.
Terrazzo Floors	1. Scrub with cleaners to remove old soap films, other foreign materials. 2. Rinse and remove excess water with squeegee. 3. Dry, then test small area with water to see that pores are open.	1. Densify with one or two coats, as needed, of terrazzo sealer. Avoid building up surface film.	1. Treat dry, sealed surface with cleaner containing wax. 2. Use a soft bristle broom or brush daily. Repeat applications of wax-cleaner occasionally.	1. Clean and rewax dull or discolored areas at once. 2. Make sure sealer is in good condition at all times to prevent pitting.
Ceramic Tile	1. Clean with soap-type cleaner; rinse with water.	1. Seal severely etched tile with coats of thinned varnish. Allow time for drying between applications.	1. Wax with water-emulsion wax or deodorizing wax cleaner. 2. Use antiseptic dust control compound in sweeping.	1. Clean and rewax dull or discolored areas at once.
Slate & Quarry	1. Same cleaning procedure as recommended for ceramic tile.	1. Same sealing procedure as for etched ceramic tile.	1. Same maintenance procedure as recommended for ceramic tile.	1. Follow same procedure as recommended for ceramic tile.
Marble Floors	1. Wet surface; clean with mild scrub soap.	1. Special resinous sealers are effective on exposed installations. (Most sealing problems with marble floors cannot be generalized.)	1. Acceptable water-emulsion waxes may be used. 2. An antiseptic dust control compound may be used on waxed floors.	1. Make sure routine cleaning is removing all dirt, stains and discolorations. Make sure cleaner is not harming surface.



Alwac's electronic components are arranged into standard plug-in units to minimize maintenance. As many as ten operators using electric typewriters can share the computor simultaneously

Electronic Computors—Economy Size

Benefits of the computor's magic are not confined to the industrial giants. This compact design can be significant to firms with a 500-man force

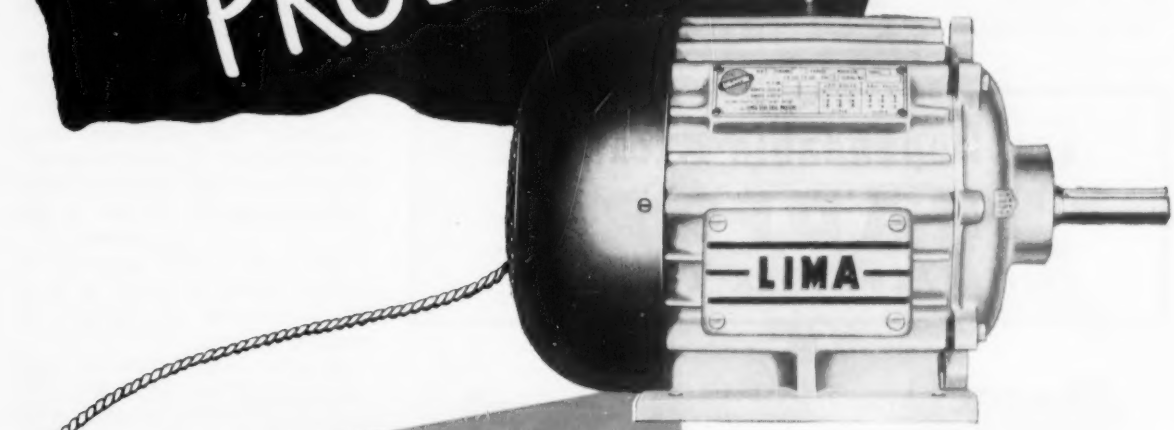
ELECTRONIC computers that do something close to thought are increasing their impact on industrial programming. Application already is extensive in the aircraft industry.

Lockheed Aircraft Corp. recently used an electronic computer to do a problem in a half-week's time that would require operators with four conventional desk calculators 66 weeks to complete. Five years ago Douglas Aircraft had less than 500 sq ft of floor space devoted to computing equipment. Today its machines take up more than 12,000 sq ft, with more to come.

Development by Logistics Research Inc., Redondo Beach, Calif., of Alwac, a low-cost, general purpose electronic digital computer, has demonstrated that the electronic brains can come in smaller, less expensive packages. The project is backed by Dr. Axel L. Wenner-Gren, Swedish industrialist. Alwac stands for Axel L. Wenner-Gren Automatic Computer.

Two R's—Technically, Alwac is a serial, binary computer with internally programmed magnetic drum. The machine consists of arithmetic, memory and control units and input-output sections. It features a large-capacity rotating magnetic

POWER PROBLEMS?



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drum memory of 2048-word main storage capacity which stores the numbers and commands used to perform its computations. All units of the machine make use of information stored on the surface of this drum.

The drum is composed of a cylinder rotating about its longitudinal axis, with a number of reading and writing heads mounted in near-contact with cylinder surface. A given head serves both as a reading and writing device.

Basic commands are put into the machine and answers obtained from it on electric typewriters or paper tape. As many as ten electric typewriters can be attached to the machine at various remote locations. Automatic graph following and graph plotting equipment can also be provided as input and output equipment.

Job Justification—Firms with as few as 500 employees can justify an electronic data handling machine, say its developers. The machine pays for itself by increasing product output through better use of facilities. It can anticipate production bottlenecks and make decisions for correction. It can assign shop orders to machine tools and determine what is likely to happen in the shop for each hour for months at a time. It can reduce overhead by doing the work of scores of clerks.

Other jobs in the factory include inventory and production control, cost accounting, setting piecework prices, preparing manufacturing cost estimates, scheduling manufacturing operations.

The computer is installed in three cabinets mounted on ball-bearing swivel casters. Cabinet containing the magnetic drum memory is 28 x 34 x 64 inches and weighs about 380 pounds. Cabinet containing power supply is the same size and weighs approximately 520 pounds. Third cabinet, containing logical elements, is 28 x 48 x 64 inches and weighs 500 pounds.

Machine will operate from either a standard 110 or 220-v, 60-cycle, single-phase outlet and requires approximately 4 kw of power. Internal fans cool the computer to normal room temperature.

Ignitrons for Mill Drives

Ignitron rectifiers will be the conventional hot strip mill drive of the future. This was the prognostication of two Westinghouse Electric Corp. engineers during a mining and metal industry conference at the winter general meeting of the American Institute of Electrical Engineers in New York.

The engineers described ignitron installations at Fairless Works of U. S. Steel Corp., Morrisville, Pa., and came to the following conclusions:

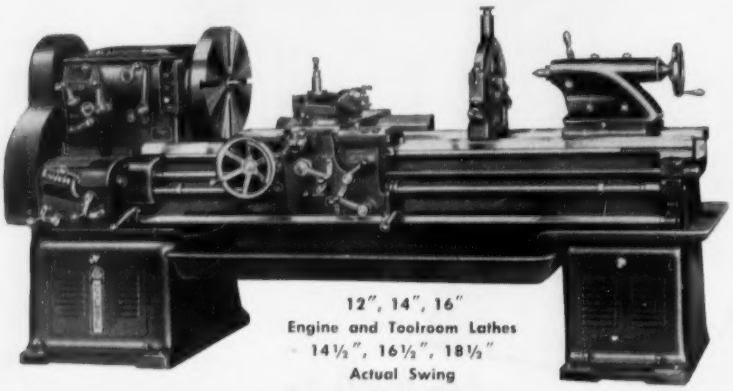
The usual advantages of ignitrons over conventional rotating power supplies are higher efficiency, lower initial costs, simpler and lower installation costs and lower maintenance expense.

Ignitron rectifiers are well suited for steel mill control operations since the starting and stopping sequences are quite simple. Voltage control with them is simplified since the regulator need carry only a small current to control bias voltage.

For Dependable Accuracy!

BRADFORD

METALMASTER LATHES



12", 14", 16"
Engine and Toolroom Lathes
14½", 16½", 18½"
Actual Swing

BRADFORD Metalmaster Geared Head Lathes have earned an enviable reputation throughout the years for high efficiency and dependable accuracy. But today's new Metalmaster is even finer! Built to the most exacting standards of workmanship, and of the finest materials and components, these new Metalmaster Lathes are equipped with many outstanding features.

POWER for Your Job: 2 HP to 10 HP

SPEEDS for Your Job: 16 RPM min. to 1000 RPM max.

FEED: 72—.00072 to .1780

THREAD RANGE: 1½ to 368, including 11½ and 27 without extra gearing

• *Let our Engineers solve your lathe problems.*

• *Write for Bulletin 179*

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653 Evans St., Cincinnati, Ohio • *Precision Since 1840*

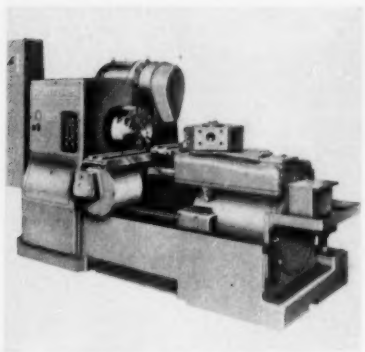
DELIVERIES: 30 days, subject to prior sale

Lathe Eyes Heavy Jobs

RISING production costs, expanding civilian markets and demands of the defense program are all placing new emphasis on reduced machining time.

Faster metal removal with carbide tooling provides a partial answer, but also needed are automatics powered to take full advantage of carbide's fast cutting potentialities. New model 4-U automatic turret lathe recently announced by Potter & Johnston Co., Pawtucket, R. I., is specifically designed for heavy metal removal. A recently installed 4-U has consistently removed 4 pounds of metal in 30 seconds. Job is being done in regular production.

Features—An 8-inch type A-1 American standard spindle nose has been adopted for the spindle, taking 10, 12, or 15-inch chucks. Spindle is mounted in heavy duty Timken double-taper roller bearings, front and rear.



DESIGNED FOR CARBIDE
...4 pounds of metal off in 30 seconds

Four automatic speed changes are provided by multi-disc friction clutches electro-pneumatically controlled by adjustable dogs. Pick off gear selection offers spindle speeds ranging from 45.5 to 1177 rpm. Magnetic clutch and brake give cushioned starts and stops.

Independent Slides—Turret slide has a travel of 12 inches, of which 8 inches is feed. Slide is also adjustable along the base ways. Coolant may be pumped either overhead or through the drills or boring bars.

Front and rear cross slides are independent and can be easily adjusted along the base ways. Slides are operated by large cam drums to work with any or all turret faces.

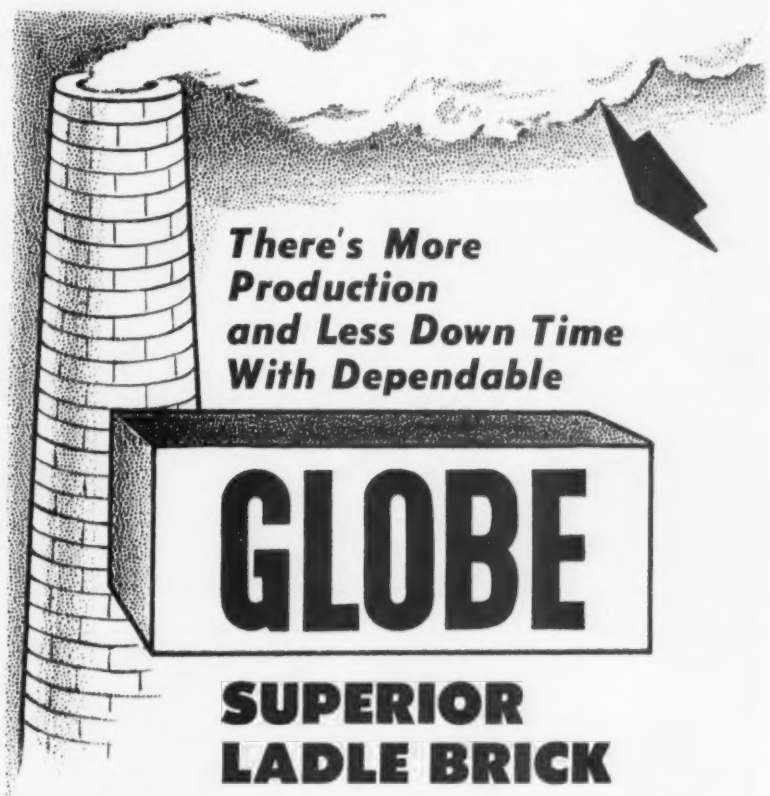
A standard travel and feed of 4½ inches and an auxiliary movement of 2 inches travel to operate turret slide tools is provided. Six automatic feed changes permit an over-all feed range of 0.002 to 0.163 inch per spindle revolution, to both cross slides and turret slide.

Insulation Handbook Enlarged

Fourth edition of "Mineral Wool Insulation Specifications & Standards", has been published.

The 24 specifications and standards in the handbook include 7 by A.S.T.M., 2 by the U. S. Maritime Commission, 8 Federal Specifications and 3 Commercial Standards.

Copies may be obtained, at $3.50 each, by writing Executive Director, Industrial Mineral Fiber Institute Inc., 441 Lexington Ave., New York.



The best thing you can say about ladle brick is that the steel industry can't very well do without them. The least thing you can say about them is that if they don't hold up they aren't worth the investment. We have been standing back of our products since 1873 . . . standing back of them so consistently our products have become a by-word among melters of metals. We fill any order any time, and are prepared to make all deliveries to suit your schedules.

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The GLOBE BRICK Co.
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careful testing proved SUPERIORITY of

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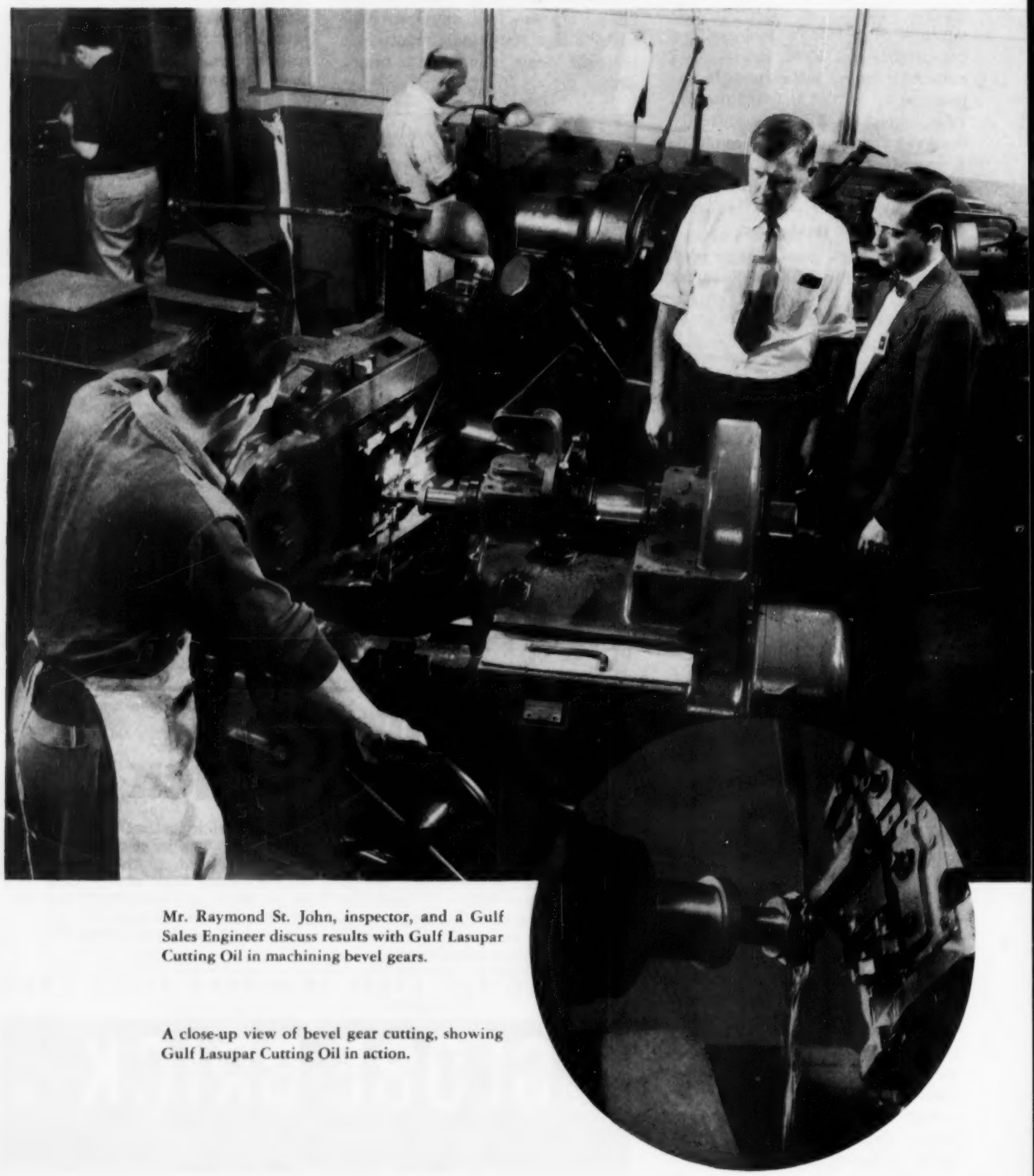

Mr. Raymond St. John, inspector, and a Gulf Sales Engineer discuss results with Gulf Lasupar Cutting Oil in machining bevel gears.

A close-up view of bevel gear cutting, showing Gulf Lasupar Cutting Oil in action.

CUTTING OIL

for every cutting operation at Belock Instrument Company, Long Island, New York

Belock wanted a cutting oil that would produce precision instrument parts to extremely close tolerances, and give an excellent surface finish with as few tool changes as possible.

After careful tests, using many kinds of cutting fluids, they found that Gulf Lasupar Cutting Oil gives them better performance over their entire range of machining operations on the many types of steel they process.

In Gulf Lasupar Cutting Oil you get three degrees of sulphur activity, each designed to provide better protection for the tool and to insure a better finish under a given set of machining conditions—(1) extremely active free sulphur held in a stable solution, (2) sulphur combined with mineral oil by a special Gulf process, and (3) sulphur combined with fatty oil.

A Gulf Sales Engineer will be glad to demonstrate the advantages of Gulf Lasupar Cutting Oil in your plant. You will find him always "on call" at your nearest Gulf office.

A Bechler Swiss Automatic Screw Machine Cutting A.I.S.I. 416 Stainless Steel. These Gear Blanks are held to tolerances of .0003 of an inch.

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Above: Machine runs off control board. In case of trouble on line, bells and lights indicate trouble area. Right: Operator inspects Multijet nozzle that discharges CO_2 into 1575-gallon quench tank in case of fire

How to Beat Fire to the Punch . . .

Company protects its in-line hardening and tempering machine (and ultimately the plant and personnel) by putting extinguishing equipment at three potential trouble spots

PROGRESS solves old problems, but, quite often, it brings on new ones.

When sales of hex-socket screws and related items gained volume at the Allen Mfg. Co., Hartford, Conn., management looked for and found a way to combine operations.

A continuous, in-line hardening and tempering machine, designed by Westinghouse, was installed (STEEL, p. 90, Nov. 23, 1953).

Material is spread on a vibrating feeder tray; then moves slowly into a gas-fired, radiant-tube, hardening furnace that operates up to 1700° F. From here items pass into an oil quench tank, through a wash and into a gas-fired tempering furnace that operates up to 1000° F. Final oil quench completes the operation—products are dumped into metal trays ready for packing.

The Catch — Of course, plants are justly proud of successful modernization programs, but Allen (and its insurance underwriters) had the foresight to look at hard facts: What about fire?

The new piece of equipment is valued at $50,000, but, more important, an Allen spokesmen said:

"Should the machine be damaged and shut down, the resulting lost production of screws and related items could seriously hamper delivery schedules. Further, we were concerned also with possible damage to the plant resulting from a quench tank blaze and the safety of employees working in the area."

What They Did—Allen contacted Walter Kidde & Co. Inc., Belleville, N. J., experts in scientific fire protection. Here's what they found:

The machine's large quench tank contains about 1575 gallons of oil. While its temperature is thermostatically controlled and kept far below its flash point, fire control men knew that when a flammable liquid and oxygen are present with an adjacent ignition source, the possibility of fire must not be overlooked. So a fire extinguisher system was installed to guard the discharge end of the hardening furnace, the quench tank and the 11-foot long inclined drain area leading to the wash.

Roundup article on scientific fire protection (by Harry Chandler, associate editor) will appear in the Feb. 8 issue of STEEL. It will cover fire hazards common to the metalworking industry.

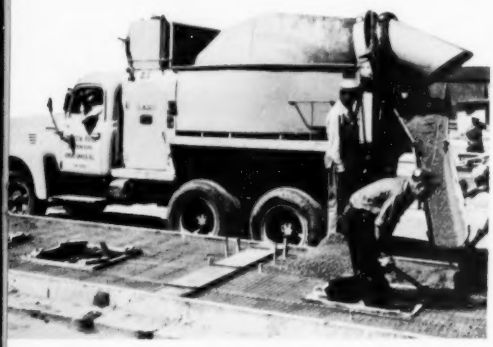
Protection — Should fire flash, two 100-pound cylinders of carbon dioxide are manually triggered by either of two pull boxes—one at the feed end, the other at the quench tank. Two additional cylinders are in reserve.

Carbon dioxide (under its own pressure) rushes from cylinders, through piping and is discharged from Multijet nozzles, totally flooding the three areas with the fire-smothering gas. It reduces oxygen to the point where it won't support combustion.

Built into the piping is a pressure-operated switch that is closed by the passage of CO_2. When tripped, the switch causes the feed and conveyor motors to stop.

New facts for your file on U·S·S HIGH STRENGTH STEELS

Truck body platform frames built of USS COR-TEN steel are 20% lighter...4 to 6 times more rust resistant



In truck mixer parts, USS MAN-TEN steel adds strength, increases resistance to abrasion, impact and vibration

In this 4½ cu. yd. Lite-weight, Heavy Duty Hi-Boy Truck Mixer built by Blaw-Knox Company, Pittsburgh, Pa., the mixing drum, mixing blades, charging hopper and discharge chute are made of USS MAN-TEN steel. In all these parts which are subjected to the highly abrasive action of the concrete batch, MAN-TEN steel's greater resistance to abrasion plays an important part in prolonging life and keeping maintenance costs and down-time to a minimum.

MAN-TEN steel's high endurance limit, 40% greater than carbon steel, and its high yield point of 50,000 psi are additional properties that pay off in increasing the durability of this equipment.

During the past 20 years, USS High Strength Steels—USS COR-TEN, USS MAN-TEN and USS TRI-TEN—have been used in materials-handling, road-building and excavating equipment of all kinds to reduce weight, increase working capacity and to give it the stamina to stay on the job.

Find out how these "steels that do more" can be applied to improve your equipment—how readily they can be fabricated—and how little they cost to use. A letter to our nearest district office will bring you this information.

By using 10-gage USS COR-TEN steel in place of 8-gage hot rolled carbon steel, Giant Manufacturing Co., Council Bluffs, Iowa, obtains maximum strength with minimum weight in the platform frames of their farm truck bodies.

This construction, which gives farmers and truckers several hundred pounds more loading capacity in these units—and thus cuts transportation cost per mile of load—has been used almost exclusively in Giant trucks since 1946.

"During this time," says the manufacturer, "we have not had a failure due to distortion or corrosion of the platform frames. Our fabrication department states that shearing and forming USS COR-TEN steel, using power equipment, is comparable to equal gages of regular carbon steel. COR-TEN steel's welding properties are excellent . . . it is easily prepared for application of enamel finish and has absolutely no tendency to flake or peel the finished coat."

Another well-known builder of farm wagons says, "We have found that the use of high strength steels is almost a must in the manufacture of farm equipment. All farm implements are subject to terrific abuse in the field and are generally without any protection whatsoever from the elements. The anti-corrosive qualities of high strength USS COR-TEN steel are naturally a major selling point in equipment of this type."

USS MAN-TEN steel saves weight, ensures longer life, in air-balanced oil pumping unit

Designers of equipment for the oil industry have found in USS High Strength Steels an economical and practical solution of many of their problems. How to reduce weight? How to increase strength? How to resist corrosion? How to prolong life?

Typical is this application of USS MAN-TEN steel in the walking beam of this ultra-modern air balanced pumping unit built by the Parkersburg Rig and Reel Company, Parkersburg, W. Va.

By using USS MAN-TEN steel construction in the 24 in. walking beam in place of carbon steel, the weight of this important member has been reduced 16.6%. Yet, because USS MAN-TEN steel has a yield point of 50,000 psi—one and a half times that of carbon steel—the lighter beam is much stronger. Additional durability is ensured by the fact that MAN-TEN steel has 40% higher fatigue strength, thus providing greater resistance to vibration and reversal of stresses.

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

"Our forgings really

UNITED STATES STEEL

y start with *a bang!*"

says Vincent Czaplinski

U. S. STEEL SENIOR MELTER FOREMAN

● First you are warned with a shrieking whistle. Then with a roar, an explosive blast pierces the plug that seals the open hearth tap hole. When the smoke lifts, you finally see the bright stream of molten steel shoot from the bottom of the furnace to fill the 230-ton ladle.

This is probably the most dramatic single operation in the making of steel forgings. It's the beginning of many U·S·S Quality Forgings—giant carbon steel water wheel shafts, massive anvil bases for drop hammers, high alloy turbine rotors and ship propulsion shafting.

Vincent Czaplinski came to the open hearth right out of school. For 23 years, he worked up through 3rd, 2nd and 1st helper—doing everything from cleaning out tap holes to building new furnace bottoms. Today, as Melter Foreman in charge of 5 furnaces, it is his job to hit the analysis right so that the forging you get is the finest that can be made. Relatively few men in the country know as much about actually making steel as Vincent Czaplinski, and he is typical of the men who produce the quality steel that goes into every U·S·S Quality Forging.

Write for our free 32-page booklet that describes the men, the steel and the equipment that go into U·S·S Quality Forgings. Write to United States Steel, 525 William Penn Place, Room 4227, Pittsburgh 30, Pa.

USS *Quality* FORGINGS

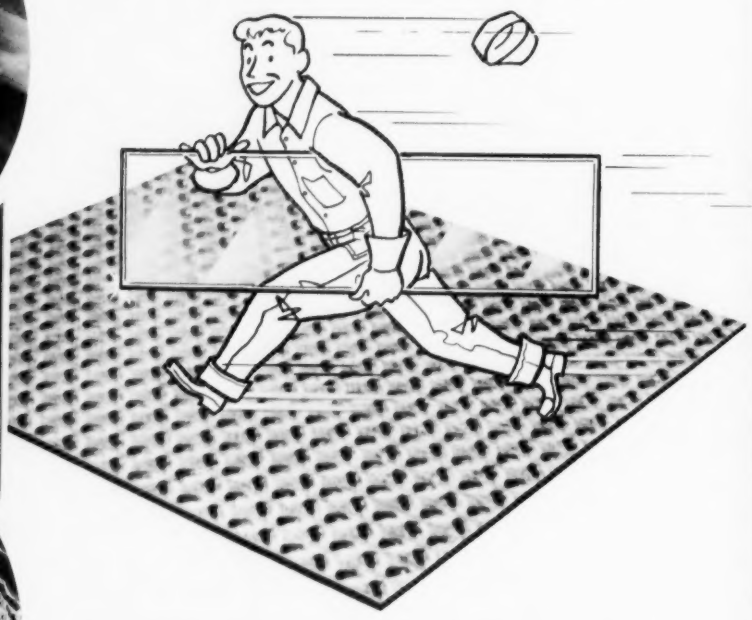
heavy machinery parts — carbon alloy, stainless

drop hammer bases and columns

electrical and water wheel shafts

forged steel rolls and back-up roll sleeves

For safe materials handling that can be quicker too,
Install rugged, no-skid Multigrip *. . . that's the thing to do.*
Then your floors are well protected and last for many a year,
And workers move much faster without the slightest fear.
Multigrip *lasts longer . . . won't splinter, crack or rot;*
Wheels and feet won't slide or slip . . . whether it's wet or not.



● U·S·S Multigrip Floor Plate is designed for safety and for economy. It lessens the danger of slipping and falling as it provides maximum skid-resistance in all directions even if the floor is wet or greasy. The flat-topped, sure-grip risers are comfortable to walk and work on . . . thus cutting down on fatigue, another big factor in causing industrial accidents. Multigrip is easy to keep clean . . . there are no niches where dirt can hide. And water drains off quickly in any direction.

Multigrip is a long-life, heavy-duty steel flooring that will pay off in reduced maintenance costs as well as reduced accident rates. It can be used structurally or to protect existing concrete or wooden floors. And it is easy to install . . . comes in larger sections allowing for fewer joints, less waste, less down-time for installation.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, CHICAGO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S multigrip

FLOOR PLATE

USS

Sold by leading distributors from coast to coast

UNITED STATES STEEL

STEEL

January 25, 1954

Market Outlook

THESE are the days steel buyers have longed for. They don't have everything their own way yet, but they're much more the masters of their fates than they were a few months ago.

ZIPPY SERVICE—Steel buyers aren't finding many out-and-out reductions of standard prices of steel, but they are able to get the seller to pay some of the freight charges, and most noticeable of all, they can get what they want when they want it. And if they don't watch out they'll get it *before* they want it, because some mills, with their January work out of the way, are rolling orders booked for February delivery. If they didn't start two weeks early to roll February tonnage they couldn't keep operations as high as they are.

There has been some improvement in ordering by two automobile producers, General Motors and Ford, but this has not been matched by a similar pickup from other automakers.

WAITING FOR BUSINESS—While some steel producers are rolling orders ahead of time, one eastern mill discontinued ingot operations until it accumulates sufficient business to justify a resumption. Another reflector of the need for business is the newly expressed willingness of some mills to accept orders for odd sizes and shapes of products, which only a few months ago they would have rejected.

Although these conditions have not brought any widescale reductions in standard mill prices, they have prompted some price sniping at the warehouse level.

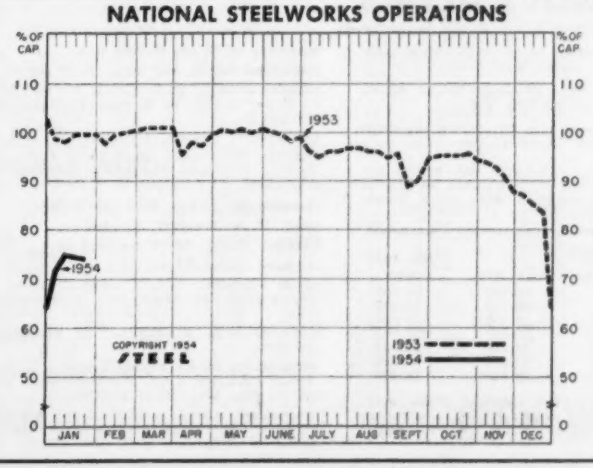
EASY PACE—The reduced demand for steel is reflected by a slowly shrinking rate of steel ingot production. For the second consecutive week, output declined a half a point, and in the week ended Jan. 24 was at 74 per cent of capacity. While a half-point decline a week is not a lot it does signify there is no upward thrust in the steel business at the moment.

REASONS FOR OPTIMISM—Steelmen, as a whole, are not discouraged, not pessimistic. They expected their business to take this downward turn. The future is not without hopeful signs. The seasonal factor is back in business once again, and historically there's a seasonal upturn in the steel business in the spring. March has long been regarded as a month of high steel production. Other encouraging signs are a modest pickup in employment at farm tractor plants, continued expansion in the public utility field and newly announced expansions in the automotive industry.

CONTRASTS—One of the steel industry's customers, the household appliance industry, is showing no signs of a general recovery. That is evident from the dull demand for grades of silicon steel sheets used in fractional horsepower motors which go into appliances. High-grade silicon sheets used in large power units are sustained, confirming expectations that public utility expansions will continue.

THE PRICE PICTURE—Lack of a strong upward push in the steel business is weakening the sentiment in the scrap market, although the grades on which STEEL's scrap price composite is based managed to hold at $29.17 a gross ton. Scattered price adjustments on steel were not sufficient to affect STEEL's price composite on finished steel either. It remained at $113.91 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Jan. 24	Change	Same Week 1953	Same Week 1952
Pittsburgh	85.5	— 0.5*	104.5	97
Chicago	78	— 0.5*	105.5	101.5
Mid-Atlantic	82	0	95	99
Youngstown	70	— 8	106	105
Wheeling	81	— 1	103.5	100.5
Cleveland	83.5	— 4.5	100	97.5
Buffalo	71	+ 6	106.5	104
Birmingham	87	— 8	106	104
New England	60	— 7	90	83
Cincinnati	69.5	+ 0.5	93.5	101
St. Louis	65	— 2	101	81.5
Detroit	89	+ 2.5	104.5	104.5
Western	80	+ 3	105.5	104
Estimated National Rate	74	— 0.5	99.5	99.5

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,384,549 net tons in 1954; 2,254,459 tons in 1953 and 2,077,040 tons in 1952.

The Metalworking Outlook—p. 39 Technical Outlook—p. 87

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Jan. 19

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.863	Pipe, galv., buttweld (100 ft)	17.666	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.809
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.012
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 19 1954	Jan. 12 1954	Month Ago	Dec. Average
(1947-1949=100)	141.3	141.4	141.5	141.4

STEEL's FINISHED STEEL PRICE INDEX

	Jan. 21 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	151.86
Index in cents per lb	5.140	5.140	5.140	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Jan. 21 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$113.91	$113.91	$114.64	$110.98	$97.77
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	29.17	29.17	31.33	43.00	41.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 21 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.30	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.20-6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ¼-⅝", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Jan. 21 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.30
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.80
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$30.50	$30.50	$32.50	$44.00	$42.00
No. 1 Heavy Melt, E. Pa.	28.00	28.00	31.00	41.50	43.00
No. 1 Heavy Melt, Chicago	29.00	29.00	30.50	42.50	39.00
No. 1 Heavy Melt, Valley	29.50	29.50	29.50	44.00	37.75
No. 1 Heavy Melt, Cleve.	28.50	28.50	29.50	43.00	37.25
No. 1 Heavy Melt, Buffalo	25.00	27.50	29.50	43.00	45.50
Rails, Rerolling, Chicago	38.00	38.00	42.50	52.50	57.50
No. 1 Cast, Chicago	32.50	32.50	33.50	43.00	57.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

DAILY NONFERROUS PRICE RECORD

	Price Jan. 21	Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1953 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.750	29.750	24.500
Lead	12.80	Jan. 18	13.30	13.300	13.300	13.925
Zinc	9.50	Jan. 18	10.00	10.000	10.000	12.500
Tin	85.00	Jan. 21	85.25	84.913	83.352	121.500
Nickel	66.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium 99.8%, Freeport, Tex.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 12.80, chemical 12.90, corroding 12.90, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 46c, 100 to 4000 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

Mercury: Open market, spot, New York, $188-$191 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "Y" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 85.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $5.85. Treated ingots $7.95.

Zinc: Prime western 9.50, brass special 9.75, intermediate 10.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 10.85, special high grade 11.00, die casting alloy ingot 14.00, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00. (Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 19.50-20.50; No. 12 foundry alloy (No. 2 grade) 18.50-19.50; 5% silicon alloy, 0.60 Cu max., 21.75-22.75; 13 alloy, 0.60 Cu max., 21.75-22.75; 195 alloy 20.75-21.25; 108 alloy 19.75-20.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.25-21.00; grade 2, 19.00-19.75; grade 3, 18.25-19.00; grade 4, 16.50-17.50.

Brass Ingot: Red brass, No. 115,24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.00 per cwt; pipe, full coils $18.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

NICKEL, MONEL, INCONEL	"A" Nickel	Monel	Inconel
Sheet, C.R. ...	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.8	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-6.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 11.00; low copper clippings 11.00; mixed clippings 9.00-10.00; old sheet 8.00-9.00; borings and turnings 5.50; pistons and struts 5.50; crankcases 8.00-9.00; industrial castings 8.00-9.00.

Copper and Brass: Heavy copper and wire, No. 1 22.00; No. 2 copper 20.00; light copper 18.00; No. 1 composition red brass 15.50-16.00; No. 1 composition turnings 14.75-15.25; mixed brass turnings 9.50-10.00; new brass clippings 15.50-16.00; No. 1 brass rod turnings 10.50-11.00; light brass 8.50-9.00; heavy yellow brass 11.00-11.50; new brass rod ends 13.00; auto radiators, unsweated, 11.00-11.50; cocks and faucets 13.00-13.50; brass pipe 14.50-15.00.

Lead: Heavy 9.50; battery plate 5.00-5.50; linotype and stereotype 12.00; electrotype 10.50; mixed babbitt 11.00-11.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 22.00-24.00; old sheet 20.00-22.00; turnings 14.00-16.00; rods 22.00-24.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.25; new die cast scrap, 3.00; old die cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 13.50-14.00; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 12.50-13.00; mixed clippings 12.25-13.00; old sheet 10.50-11.00; old cast 10.50-11.00; clean old cable, free of steel 13.50-14.00; borings and turnings 11.00-11.50.

Berryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 23.00-23.50; No. 2 copper 21.50; light copper 20.00; refinery brass (60% copper) per dry copper content 19.00; auto radiators, 13.75, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 23.00-24.00; No. 2 copper 21.50-22.00; light copper 20.00-20.50; No. 1 composition borings 17.00-17.50; No. 1 composition solids 17.50-18.00; heavy yellow brass solids 13.50-14.00; yellow brass turnings 13.00; radiators 13.50-14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-500 lb 53.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.181; 100-300 lb $1.031; 400-900 lb $1.007; 100-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 88.5; 20,000 lb and over 82.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ...	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

New round of domestic price reductions hits nonferrous markets. U. S. prices are cut to meet import quotations after sharp drop on London exchange

ANOTHER ROUND of price reductions hit nonferrous markets last week.

Lead and zinc were cut one-half cent a pound, scrap copper and aluminum slipped as much as one cent a pound. Lead-zinc reductions stemmed directly from a sharp drop on the London Metal Exchange which forced lowering of U. S. prices to meet import quotations. The weakness abroad extended to copper, but its influence wasn't strong enough to disturb U. S. prices and the guessing game was resumed on when copper will break.

New Alignment—Lead now sells for 13.00 cents, New York, or 12.80 cents, St. Louis. Last week's decline marked the first change in lead since mid-September and sets the heavy metal back to its level of last May. Lead products also fell, full lead sheets and lead pipe now bring 18.00 cents a pound.

Now quoted at 9.50 cents for prime western grade, zinc is at its lowest figure since 1949. Top-heavy stocks and continued smelter production promise to keep the market depressed.

Scrap Too—The secondary metal market's weakness of weeks was underlined by reductions in smelter buying prices. Copper grades dropped a half-cent, second reduction within a week. Aluminum scrap dipped an average of a half-cent, putting base price for 2S clippings as low as 13 cents.

Posting of the new price schedules brought the normal slowdown in buying. Purchasing men are holding off while the market dust settles. Average price is called for in the business that is placed.

A Silver Lining

A 10.5 per cent increase in U. S. silver consumption was recorded last year, says Handy & Harman, precious metals refiners and fabricators. Use of silver for industrial purposes continued its rise in 1953, and the trend is expected to go on.

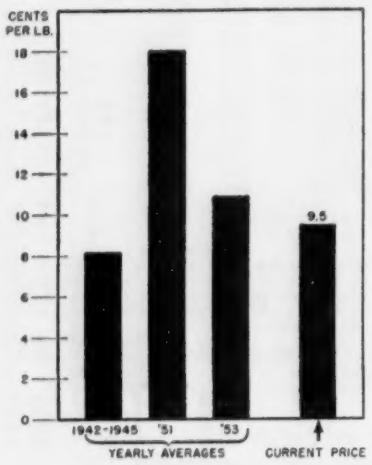
Consumption in the arts and industry amounted to 105 million ounces last year, reports the company. Pointing out that silver changed price only four times last year, all of which occurred in January, the company's review states that "not since World War II when the price was subject to government controls has such unusual stability been experienced."

Product Line Expanded

A broadened range of commercial availabilities in aluminum mill products is announced by Kaiser Aluminum & Chemical Sales Inc. Stemming from expansion of fabricating facilities since Korea, Kaiser is offering a wider range of sizes in sheet and plate, and new product classes. The company now produces close to 30 per cent of U. S. primary aluminum.

ZINC PRICE RETREATS

Prime Western, East St. Louis



Maximum flat sheet widths have been increased to 72 inches in non-heat-treatable alloys and 80 inches in heat-treatable alloys. Minimum gage of 0.006 inches in widths to 36 inches is offered in NHT alloys, 0.012 inches in widths to 42 inches in HT alloys. Coil sheet minimum gage has been reduced to 0.006 inches in widths to 60 inches. Standard gages of 0.018 inches and 0.016 inches have been added in utility sheet.

In annealed, as-fabricated and heat-treated tempers of plate, maximum thickness is now 2½ inches, and widths run to 96 inches in thickness to ⅝-inch and 100 inches above that size. Stretcher-leveled plate now can be supplied in thicknesses to 2 inches.

Extruded round tubing is now available in size range of ¾ to 4 inches in 61S and 63S alloys and between 1¼ to 4 inches in 14S and 24S alloys. Welded tubing is now available in OD's of 3 to 4 inches, with other diameters to be added.

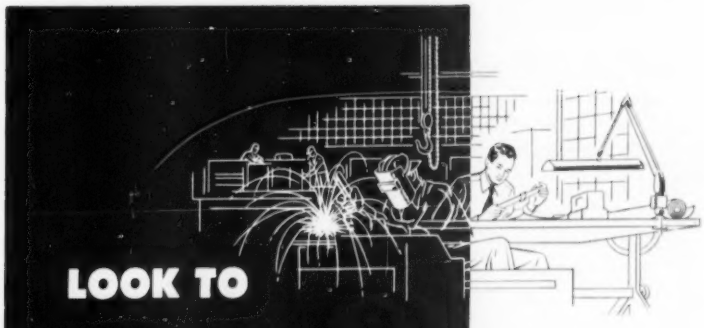
New product classes added include standard structural shapes in 61S-T6 alloy, drawn round tubing in 61S and 63S in sizes between ¾ and 1½ inches OD, ASA schedule 40 pipe sizes from 1 to 4 inches in 61S and 63S, and tubular electrical conductor from 1 to 4 inches.

Commercial alloys added in rod, bar and wire include: 3S in redraw rod, round forging stock, rolled and cold-finished rod and round drawn wire; 75S in annealed and as-fabricated tempers of round drawn wire and cold-finished round rod; 50S in redraw rod, rolled and cold-finished rod and round drawn wire; A51S forging stock; and 6 and 6½ inches diameter round sizes in forging stock. Warehouse stock of standard screw machine stock in both rounds and mill standard items in 24S alloy will be maintained at the company's Newark, O., plant. Seven new sizes of direct chill billets and six new sizes of tilt mold billets have also been added.

Nickel: Platers' Problem

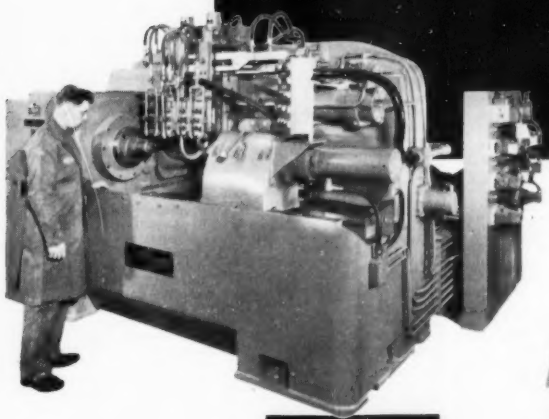
"Based on present information, it appears that availability of nickel for civilian electroplating in 1954 probably will be less than in 1953 or perhaps even less than in 1952, when the industry was not permitted to nickel-plate a number of items."

That isn't all the "discouraging information" passed on to its customers by Harshaw Chemical Co. Reporting its raw material allocations for January distribution were 28 per cent under December, Harshaw notes that "beginning in February or March, the government's intended stockpile program will produce a further reduction in total supply for civilian purposes, bringing the supply to a level drastically below the reduced amount for January." The company suggests that the platers make their problems known to the Assistant Secretary of Domestic Affairs in the Commerce department.

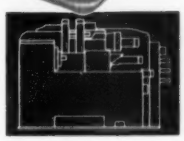


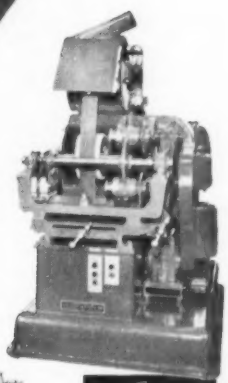
LOOK TO

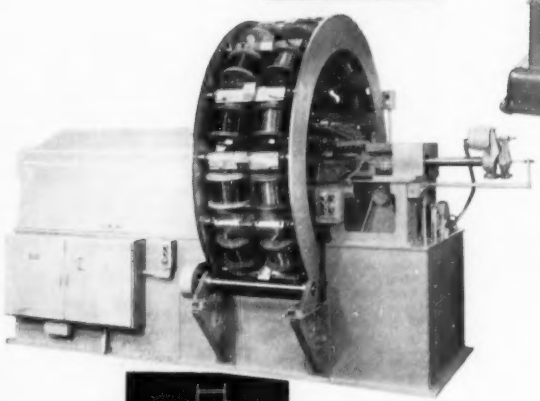
Lewis...



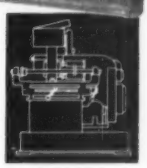
SEMI-AUTOMATIC
100-HORSEPOWER
LATHE

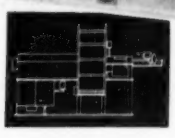






ABRASIVE
BELT
GRINDER





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ARMATURE WINDER

FOR SPECIAL MACHINERY

As experienced builders of special machinery, we can fabricate components or complete assemblies to YOUR specifications. We have the extensive welding and machine shop facilities . . . trained engineering personnel . . . and skilled production technicians that are necessary to manufacture non-standard equipment quickly and economically in limited quantities.

The three units illustrated are typical examples of the work we are doing for others. Each is a complex special-purpose machine.

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THE LEWIS WELDING AND ENGINEERING CORP.

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WE BUILD SPECIAL MACHINERY TO YOUR SPECIFICATIONS

LEWIS

1726 LW

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 131. Key to footnotes, page 133.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana, Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 ....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna, N.Y. B2..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2, U5, W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ..94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ....82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5, W14 82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ... 113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity, Ala. R2..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ...4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ...4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.30
Lackawanna,N.Y. B2 ...4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 .....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ...6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 .....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 .....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.20
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.20
Conshohocken,Pa. A3 ...4.25
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ...4.10
LoneStar,Tex. L6 .....4.50
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif. (30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ...6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago, Ill. U5, W14..5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ..5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill U5 .....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ..4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran., Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 .....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.875
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 .....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ..5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.225
Bessemer,Ala T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 .....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 .....6.725
Ind.Harb., Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 .5.20
Hartford,Conn. R2 .....5.75
Harvey, Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ..6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finishing Alloy
Ambridge,Pa. W18 .....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie, Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ...6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2, W14.6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Youngstown F3, Y1 ...6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling, Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ½-1" B2 ..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 .....4.25
ChicagoHts.(3,4) C2 ....4.15
ChicagoHts.(3,4) I-2 ...4.15
FortWorth,Tex.(26) T4..4.65
Franklin,Pa.(3,4) F5 ..4.15
Marion,O.(3) P11 .....4.25
Moline,Ill.(3) R2 .....4.25
Tonawanda(3,4) B12 ...5.00
Williamsport,Pa.(3) S19.4.50
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks.(Staybolt) L5.15.50

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ...3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925

Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ...3.925

SHEETS, H.R. (19 gage)

AlabamaCity, Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 .....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ...5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint(36) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 .....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless, Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1 .4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 .....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 .....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ...4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 .7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ....5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 .....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ...6.025†
SparrowsPoint,Md. B2..5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O. W10	6.075	....
Pitts.,Cal. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.875
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.176

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 .....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ....5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ...3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2..3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 .....7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.65
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 .....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3 6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.45
Bridgeprt,Conn.(10) S15..5.75
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit D2, M1, P20....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 .....5.45
NewBedford,Mass. R10 .6.00
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5...5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ....5.90
Pawtucket,R.I. N8, R3..6.30
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....6.20
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 .....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) N8.12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 .....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 .....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American CladmetalsCo.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn SteelCo.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co., Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beres,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.55	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I. (11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I. (12) N8	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	6.20	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7, T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. Coils (22 Ga.) (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	....	....	*8.75*	*9.75*	*10.65*
Brackenridge,Pa. A4 (cut lengths)	....	....	8.75	9.75	10.65
GraniteCity,Ill. G4 (cut lengths)	....	....	8.55	9.80	....
IndianaHarbor,Ind. I-2 (cut lgths.)	*7.85*	*8.15*	*8.75*	*9.75*	....
Mansfield,O. E6 (cut lengths)	*7.85*	*8.15*	*8.75*	*9.75*	*10.65*
Newport,Ky. N9 (cut lengths)	*7.65*	*8.15*	*8.75*	*9.75*	*10.65*
Niles,O. N12 (cut lengths)	*7.85*	*8.15*	*8.75*	*9.75*	....
Vandergrift U5 (H.R., cut lengths)	....	8.15	8.75	9.75	10.65
Warren,O. R2 (H.R. Sheets)	*7.85*	*8.15*	*8.75*	*9.75*	....
Zanesville,O. A10	....	*8.90*	*9.50*	*10.50*	*11.40*

C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)
Fully Processed (Semi-processed ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40
IndianaHarbor,Ind. I-2	*8.05*	*8.40**	*9.00**	....	....

*Semi-processed. †Fully processed.

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	*11.60*	*12.15*	*12.65*	*13.65*
Brackenridge,Pa. A4 (cut lengths)	11.60	....	....	....
Newport,Ky. N9 (cut lengths)	*11.60*	....	....	....
Vandergrift,Pa. U5 (cut lengths)	11.60	12.15	12.65	13.65
Warren,O. R2	12.35†	....	....	....
Zanesville,O. A10	*12.35**	*12.90**	*13.40**	*14.40**

*Cut lengths ¾-cent lower. †C.R. coils, annealed; semi-processed ½c lower.

C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10	....	....	*16.25*	*16.75*
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	7.40	7.65	8.05
SparrowsPoint,Md. B2	8.15	8.40	8.80
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Coke (Base Box)	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass. (12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving(8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo, W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt, B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo. S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'waPt.B2(48)	6.775 7.325*
Sterl'g(1)(48) N15	6.675 7.20
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Alip'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	145
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet, Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo.C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	158
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, (16 gage)	An'ld. Galv.	Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.40
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass. W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.30
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; †5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa, Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	..	....	..	....	...	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	−0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	...	....	....	....	....
Sharon, Pa. M6	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (§)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2¾	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2 .....5.125
Gary,Ind. U5 .....5.125
Ind.Harbor,Ind. I-2 ...5.125
Lackawanna,N.Y. B2 ..5.125
Minnequa,Colo. C10 ...5.125
Pittsburg,Calif. C11 ...5.275
Seattle B3 .....5.275
Steelton,Pa. B2 .....5.125
Torrance,Calif. C11 ...5.275

TRACK BOLTS (20) Treated

Cleveland R2 .....11.00
KansasCity,Mo. S5 ....11.00
Lebanon,Pa. B2 .....11.00
Minnequa,Colo. C10 ...11.00
Pittsburgh O3, P14 ....11.00

JOINT BARS

Bessemer,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Ind.Harbor,Ind. I-2 ...5.275
Joliet,Ill. U5 .....5.275
Lackawanna,N.Y. B2 ..5.275
Minnequa,Colo. C10 ...5.275
Steelton,Pa. B2 .....5.275

AXLES

Ind.Harbor,Ind. S13 ....6.50
Johnstown,Pa. B2 .....6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.7.05
KansasCity,Mo. S5 .....7.30
Lebanon,Pa. B2 .....7.05
Minnequa,Colo. C10 ....7.05
Pittsburgh J5 .....7.05
Seattle B3 .....7.55
So.Chicago,Ill. R2 .....7.05
Struthers,O. Y1 .....7.05
Youngstown R2 .....7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
7/8-in. under .....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger ... 3
Longer than 6 in.:
All diams. ..... +4
Lag bolts, all diams.:
6 in. and shorter.... 12
Over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts ..... List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. & C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
⅜" and smaller 58
⅞" to 1⅛", inclusive. 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex, regular heavy:
All sizes 58
Hot Galv. Nuts (all types):
⅜" and smaller 40
⅞" to 1½", inclusive. 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex.:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 34
¼-in. diam. & larger... 14
N.F. thread, all diams.. 8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish .....47.5 & 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
¾-in. through 1 in. .. 22
Longer than 6 in.:
⅝-in. and smaller ... 20
¾-in. through 1 in. .. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed.	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots.	32.00*
Brass, 20-ton lots.	29.25-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic 13.50*	
Reduced 13.50*	
Lead	7.50*
Magnesium 75.00-85.00	
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	43.50
Solder	8.50*
Stainless Steel, 302 ...	91.00
Tin	14.00*
Zinc, 10-ton lots..17.50-25.00	
Tungsten Melting grade, 99% 60 to 200 mesh:	Dollars
1000 lb and over	*4.95*
Less than 1000 lb ...	*5.10*
Chromium, electrolytic 99.9% Cr min.	3.60

*Plus cost of metal.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) 3/8" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols. for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	3.875
18.25	4.25	1	4.75	....	2.160-2.320
18	4	2	9	....	2.515
18	4	2	....	....	1.640
18	4	1	....	....	1.480
13.5	4	3	....	....	1.875
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Philadelphia, deld.	60.75	61.25	61.75	62.25
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	59.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Keeps them both spinning

as smooth as silk

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BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17[4]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[3]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.86
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.29	8.27	6.69	7.36	6.56	7.60	11.92	6.90	6.80	7.80
Erie, Pa.	6.13	...	8.15	6.38	...	6.23	7.50[4]	....	6.50	6.36	7.79
Houston	7.15	7.60	9.40	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
JerseyCity,N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[4]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.17	7.13	7.98	7.02	8.80	6.87	8.19[4]	11.89	6.87	6.63	7.65
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.26
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[5]	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	.....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [3]—500 to 9999 lb; [4]—1000 to 1999 lb; [5]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Warehouse Steel Price Tone Weakens

Most distributors hold base prices unchanged, but some make concessions by dropping certain extras. Pickup in demand is less than had been expected

Pittsburgh—Distributors here are more optimistic than they were one month ago, although their optimism is not reflected in rapidly-growing sales figures yet. Most warehouses expect demand to increase in the late first quarter.

Competition is growing in outlying areas from other industrial centers. In an effort to overcome the competition, warehouses here are improving their delivery time and completing inventories.

Philadelphia — Warehouse business is dragging, with some question as to whether or not the record for the month will exceed that for December, which, in the experience of some sellers, was the poorest last year. While prices are generally unchanged there has been some sniping, such as the dropping of certain extras. Distributors still look for the trend to be upward in February and March.

Boston—Bookings by warehouses will have to improve more over the balance of this month if January is to show much, if any, gain over December. Bulk of orders consists of small tonnages and total volume is not impressive.

Inventories are well balanced and procurement pressure on mills has disappeared. Warehouses are no longer writing up orders on a quarterly basis; they are buying generally only replacements for early shipment.

Chicago — Warehouses are watching sales volume closely for some clue as to time and proportions of upturn in metalworking consumption. Many users still appear to be living off of inventories. Demand for steel, while restricted, involves good product balance.

Cincinnati—Business is showing a little improvement, causing distributors to believe that January will be ahead of December which was definitely the slowest month of 1953. February is expected to be better. March will be the best month in the quarter. There is some evidence

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.85	$4.75	$5.00
Bar Size Angles	4.39	4.49	4.39	4.67
Structural Angles	4.39	4.49	4.39	4.67
I-Beams	4.39	4.49	4.39	4.67
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.45
Merchant Bars	4.65	4.75	4.65	4.93
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Channels	4.49	4.59	4.49	4.77
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

that the price situation has softened still more. Inventories in warehouses are continuing to grow as mill deliveries quicken.

Los Angeles — Warehouse inventories are approaching 90 per cent of normal and distributors are buying for replacement needs only. Warehouse order volume is greater than the November-December level but inquiries are reported to be noticeably fewer.

San Francisco—Distributors report a pickup in demand from the normally slow November-December period. Still short are wide flange beams. Jobbers could use some more plate, but they are "loaded" on coated and uncoated sheets. Seamless tubing is taken up about as quickly as it arrives in most district warehouses.

Seattle—The warehouse situation is tapering off to normal levels. The December drop in volume was anticipated, but 1954 opened at about the same level as a year ago. Consumers are working off their inventories, which were heavy in some cases, but by the end of the quarter buying probably will show a prewar pattern. Some sellers are overstocked on certain items, resulting in careful future placements. Sheets are in excellent supply; plates, fair. Wide flange sections continue critical, but are expected to ease within 90 days. The price situation is firm here, but in Portland, Oreg., the situation is unsettled, due to foreign steel with which some dealers overstocked. Price shading to move this stock has resulted.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 130

Boston—Concrete reinforcing bar buying is active with more volume up for estimates. While bridge and highway work predominates, the number of small lots for construction is increasing. All bar selling is subject to sharper competition with some price softening noted among distributors. Inventories are heavier and ample tonnage is available from mills to meet demand in striking contrast to conditions a year ago.

Los Angeles—Valuation of building in the city of Los Angeles was $428 million in 1953, 22 per cent higher than for 1952. Demand for reinforcing material continues noticeably weak.

Seattle — Oregon Rolling Mills, Portland, Oreg., is operating at full capacity; Seattle mills, at 70 per cent or better. New reinforcing bar business is developing and should be placed shortly.

Flat-Rolled Steel Demand Still Lags

Light inquiry, particularly for electrical sheets and enameling stock, indicates absence of pick-up in activity among motor and household appliance makers

Sheet and Strip Prices, Page 130 & 131

Philadelphia — Producers of electrical sheets report continued dull demand for the grades required for fractional horsepower motors. This is a matter of some significance, inasmuch as it indicates no general pick-up in activity among manufacturers of household appliances. Another indication of this lag is not only the absence of improvement in demand for enameling stock, but some further cancellations of tonnage scheduled originally for production of stoves, refrigerators and washing machines. Some leading mail order houses are among those who have made such cancellations recenty. On the other hand, good demand for high-grade electrical sheets required for large power units is being sustained, confirming the expectation that public utility expansion will continue on an active scale.

Boston—Flat-rolled steel users are not placing forward orders in large volume, but are stressing prompt delivery and quality. Manufacturers of automotive parts are more active, but lack extended backlogs and their steel orders are also on the conservative side. Those consumers using stainless are still drawing on inventories, notably straight chromium grades, for part of their requirements.

Electrical sheet and strip bookings are more extended into first quarter than those of most grades, but there are openings for that period; carbon capacity is not filled for February. March is now expected to be the best first-quarter booking month; these orders would be for April-May production.

Pittsburgh—The sales picture in flat-rolled products is unchanged, following slight brightening in the past weeks. The upswing expected in February is now predicted for March. Meanwhile, some area mills remain busy by working on February orders two weeks early. Short lead time in ordering continues to vex producers.

Cincinnati—A shading of sheet prices has become evident here in a few warehouse sales. The practice

(*Please Turn to Page* 140)

Hamilton Wright

U. S. Steel Shipping Ore from Venezuelan Port

United States Steel Corp., Pittsburgh, has invested more than $100 million in developing its Cerro Bolivar iron ore deposit and other facilities in Venezuela. Railroad cars bring the ore 90 miles from the mines to loading piers at Puerto Ordaz, shown above. Shipments from this port are expected to total 5 million tons in 1954. Eventually, shipments are scheduled to rise to a 10-million ton rate

means approval by 250,000 cost-wise buyers

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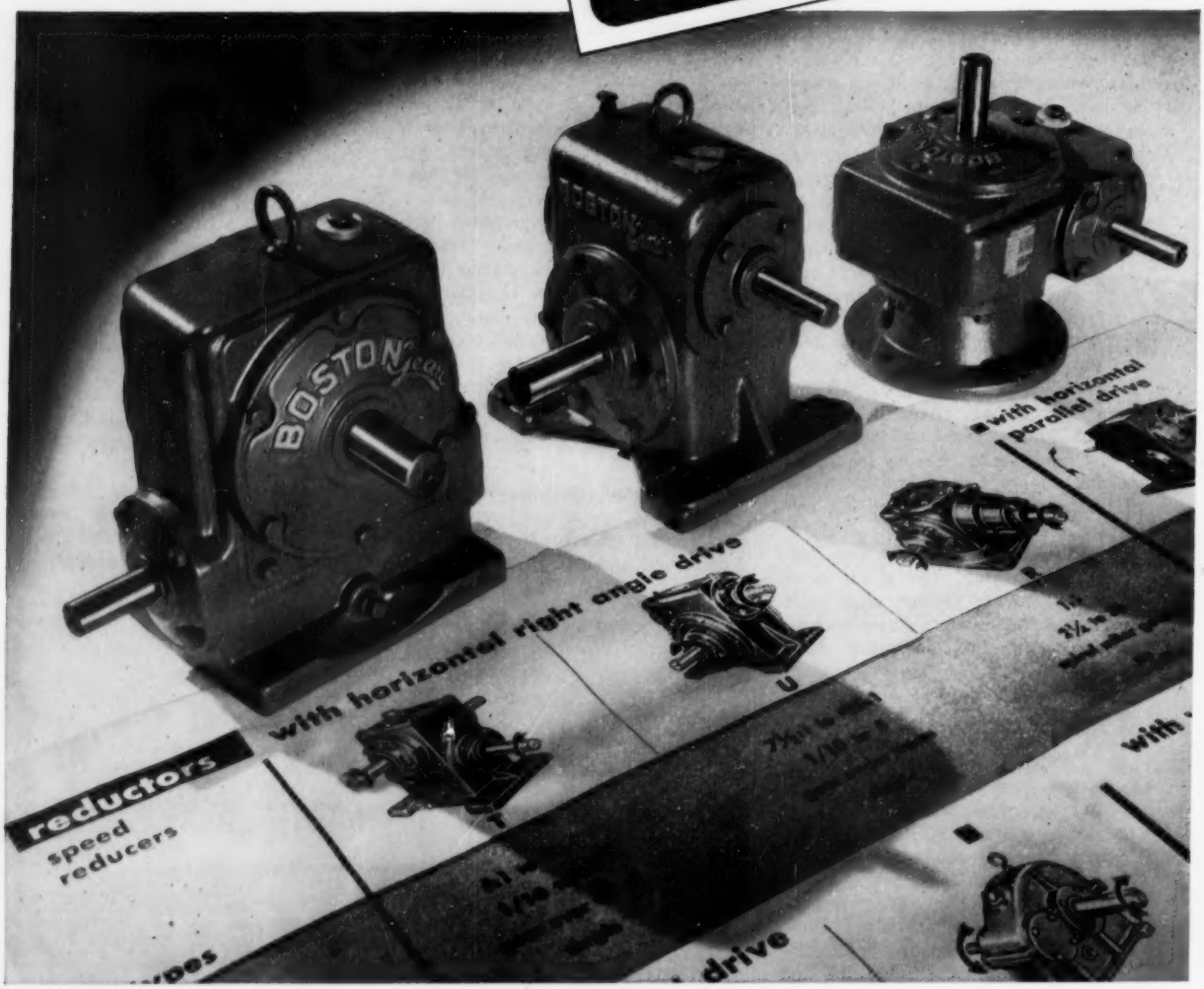

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SHOLD-A-GRIP Interchangeable Tapered BUSHINGS and SPROCKETS

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A $10,000,000 STOCK • AT 92 LOCAL DISTRIBUTORS

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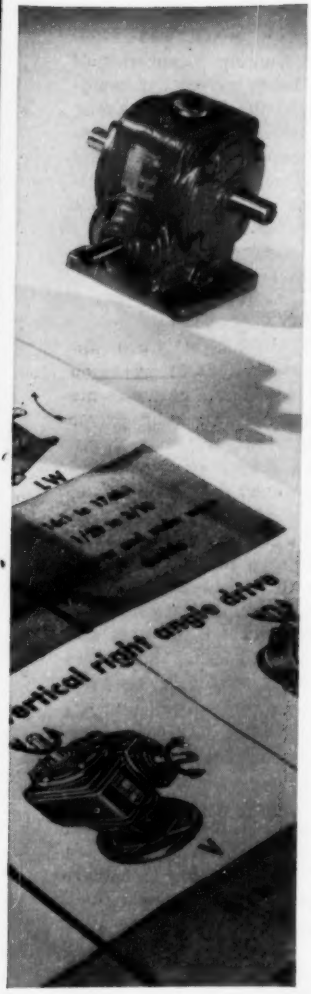

It's good sales sense to specify BOSTON Gear REDUCTORS or RATIO-MOTORS when your product's design calls for speed conversion.

BOSTON Gear is a name your prospects know and trust. It's also your lowest cost *insurance* of customer satisfaction . . . and repeat orders. Here's why:

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2. **LARGEST PRODUCTION** facilities, serving 250,000 customers in all industries.
3. **HIGHEST QUALITY.** Assures immediate interchangeability, anytime, anywhere.
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5. **WIDER RANGE** of standard types and sizes. REDUCTORS. 005 hp to 36 hp — RATIOMOTORS 32 types, 1/20 hp to 3 hp
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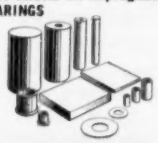

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Sheets, Strip . . .

(*Concluded from Page 137*)

is by no means general and is believed limited to relatively few distributors. The elimination of gage and size extras is the most common means of lowering prices.

Chicago—Base price increases on electrical sheets and electrical coils ranging from $3 to $6 a ton were made effective by Inland Steel Co. Jan. 18. The adjustments parallel those made by other producers recently. Galvanized sheets continue in good demand, a sizable inquiry for grain bins being a contributing factor.

Tubular Goods . . .

Tubular Goods Prices, Page 133

Philadelphia—National Tube Division, U. S. Steel Corp., last week announced discounts for buttweld pipe produced at its Fairless Works. The discounts are subject to the same extras and deductions that apply at the Division's Lorain Works.

Generally, the discount list for the Fairless Works results in lower delivered prices to consumers located in the East Coast market, including the Philadelphia and New York metropolitan areas.

In addition to standard weight pipe, buttweld extra strong pipe and buttweld line pipe will be produced at Fairless, shipments commencing Jan. 15.

The schedule of discounts at Fairless for standard black threaded and coupled pipe follow:

Size	Discount	Size	Discount
½-inch	24.25	2-inch	33.25
¾-inch	27.25	2½-inch	34.75
1-inch	29.75	3-inch	34.75
1¼-inch	32.25	3½-inch	25.75
1½-inch	32.75	4-inch	25.75

Philadelphia—Competitors of the Fairless, Pa., pipe producer are beginning to absorb freight where necessary to meet competition on the sizes produced at that point. This conclusion is on the basis of discounts recently announced — discounts comparable with those quoted at Bethlehem's Sparrows Point mill and about $4 a ton over Pittsburgh and certain other inland points. Fairless prices govern this and certain other important eastern seaboard districts, making freight absorption necessary by other producers if they are to compete on equal terms. Until recently, the Fairless mill had been devoting production to the building up of its own stocks.

Boston—Although mill prices are $4 a ton higher than those quoted at Pittsburgh and Midwest points, the schedule for Morrisville, Pa., on continuous welded buttweld pipe, 3 in. and under, carries the lowest delivered price in this area. The mill base is the same as Sparrows Point, Md., the advantage being in the freight differential. Most producers are meeting the Morrisville delivered price, but demand and shipments are light. This applies to buying of other tubular goods, although seamless, 3 to 6 in., is fairly steady.

Pittsburgh — National Tube Division of U. S. Steel Corp. anounced prices for buttweld pipe produced at Fairless Works.

Warehouses and jobbers are increasing their buying of tubular products here, stirring activity in a slow market. Seamless sales remain strong and mechanical sales are slow.

Methyl Prices Increase

Marinette, Wis.—Ansul Chemical Co. increased prices on its industrial grade methyl chloride, effective as of Jan. 1.

Methyl chloride in 100-lb and 140-lb cylinders is now priced at 21.00c per lb, an increase of 2½ cents. In 1300-lb drums, the price is now 15.00c per lb, an increase of 1 cent.

Full freight equalization continues in effect.

Wire . . .

Wire Prices, Page 132

Chicago—Prospects for wire business improve progressively in the three months of this quarter, according to present bookings. Merchant products appear more solid than manufacturers, because merchant product goods must be shipped this quarter to be in hands of jobbers when farmers start buying in the spring. Manufacturers' items are being ordered slowly and with some hesitance.

Boston—Numerous wire finishing departments are not filled for January and the trend in buying indicates this will hold for February. The volume of business booked for cold-heading wire is hardly half that of the first quarter last year; also, on smaller volume and backlogs, manufacturers of finished cold-headed products are confronted with keener price competition. Only a slight improvement in demand for some automotive specialties operates against the slack trend. That inventories are down in some instances is indicated by receipt of slightly more orders for prompt shipment. Nonintegrated mills have large wire rod inventories.

Tin Plate . . .

Tin Plate Prices, Page 132

Pittsburgh—Ending of strikes at leading canmakers brings some improvement in shipments from area mills. The renewed demand is not felt to the full extent as yet, because can companies were reputed to be holding sizable stocks of tin plate.

Mills are now breathing easier than last month, when stocks began to pile up in warehouses. Now, with the probability of increasing orders, production can be stepped up soon.

Chicago — Bulging inventories of tin plate are being moved out rapidly now that strikes at canmakers' plants have ended. Output of containers was resumed without delay and expanded schedules are expected to overcome accrued output deficit within 60 days or so.

Steel Bars . . .

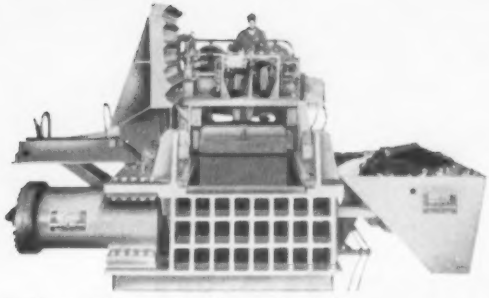
Bar Prices, Page 130

Pittsburgh—U. S. Steel Corp. announced minor revisions in extras on hot rolled carbon bars. Adjustments affect quality and processing extras involving both upward and downward price revisions of minor importance. Involved are scrapless nut quality, hot-rolled carbon bars, pickling coils and cold punch nut stock.

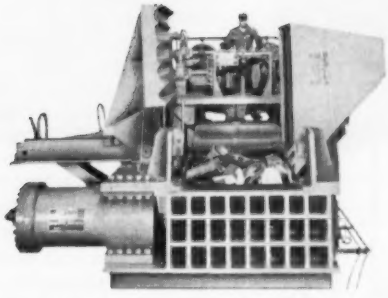
Gradual improvement is beginning in bar sales to warehouses and jobbers. Both consumers have been cutting inventories for the past two months. Sales to other customers remain slow but steady.

Boston—Improved machinability is stressed more by producers of screw machine products, touched up partially by claims for leaded stock. Cold-finished bars, both carbon and alloy, are increasingly competitive, lowest delivered price and early shipment being factors. February schedules are open for most grades and sizes. Demand by two heavy consuming government shops, Springfield and Watertown arsenals, is slipping with layoffs substantial at both plants. Yet, one leading producer has increased extras on small sized carbon bars up to 47/64 in. and on all sizes of resulphurized grades.

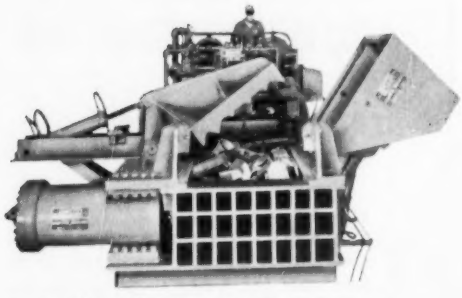
Philadelphia — Trading in carbon bars is spotty. Some producers see improvement, but all agree it is slight at best. Mills are accepting orders for odd sizes and shapes, which they would have rejected only a fairly short time ago. They are still driving hard for February tonnage and will register some gain over January. But schedules likely



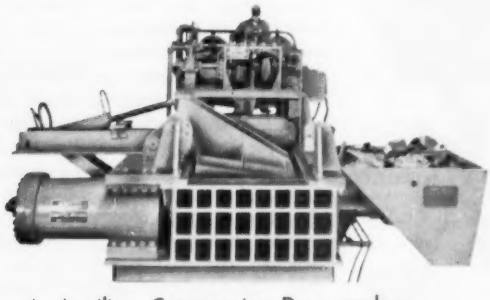
1. Here Skip Pan has been loaded.



2. Skip Pan dumps load into charging box.



3. Auxiliary-Compression Door starts its compression stroke as Skip Pan returns to be re-loaded.



4. Auxiliary-Compression Door crushes scrap into charging box.

5. At right the Auxiliary-Compression returns to up-right position and charging box door closes. Scrap is baled and then ejected. Skip Pan has been re-loaded and is ready to re-fill the charging box.

Dempster-Balester Auxiliary-Compression Door becoming a MUST for scrap metal baling

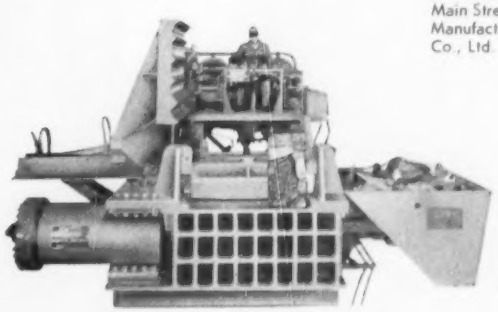
Before buying a scrap metal baling press, it is important to know that the Auxiliary-Compression Door is available exclusively for Dempster-Balesters. This door completely eliminates in some operations and materially reduces in others the costly process of tying up two or three extra men as arrangers. In addition, the hydraulically operated Auxiliary-Compression Door normally crushes scrap with one stroke . . . permitting charging box cover door to close immediately. This means a tremendous increase in production.

This increase in production and savings in man-hour costs have made the Auxiliary-Compression Door virtually indispensable for the greatest economy in scrap metal baling.

A Dempster-Balester Model 600 is shown in operation with Skip Pan Loader and Auxiliary-Compression Door. Note that every operation in the baling cycle is hydraulically controlled from the moment scrap is dumped into Skip Pan Loader until finished bale is ejected.

Write us for complete information. Dempster-Balesters are manufactured exclusively by Dempster Brothers, Inc.

IN CANADA: Sold by W. P. Favorite Co. of Canada, Ltd., 418 Main Street East, Hamilton, Ontario. Manufactured by Hamilton Bridge Co., Ltd.



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will be far from filled at the cold as well as hot mills.

Cincinnati — Customers for alloy bars are experimenting as they have not been able to do since before World War II. They are checking on the applications of materials and considering what other steel and designs can be considered in improving their products. Business for alloy bars has picked up. Stocks are pretty well balanced on the high side. Carbon bar business is little better than December. One distributor describes carbon bars as a "rat race" of oversupply and price cutting.

Chicago — Orders for bars, both hot-rolled and cold-finished, are falling below producers' expectations. Volume appears static at the moment, but a better feeling exists on future outlook. Several farm implement makers are calling back modest numbers of workers. So far, output boosts center largely on tractors.

Plates . . .

Plate Prices, Page 130

New York—Plate business is sluggish in most lines. Ship work is very spotty. Railroads and commercial car shops are specifying little and tank and boiler shops are in the seasonal lull. During the Korean emergency, seasonal influences had relatively little effect, but now with the return to more normal conditions they are more pronounced. However, these influences, instead of serving as a depressant as at this time, should serve as a stimulant before so very long in some lines. This should be true with respect to tank work and oil industry requirements in general. Spring building activity, with an accompanying pick-up in capital goods equipment, should be reflected in a broadening demand for plates. Producers believe that by the end of February, if not a little before, the outlook will be definitely better. At least, some say they will be in a much better position to know what to expect in the way of volume.

Pittsburgh — Construction companies can obtain virtually all plate required, causing them to cut their forward buying. Sales remain at a slightly lower level than in the past quarter, but shipments are expected to improve no later than March.

Boston—Mill schedules are more flexible with semifinished steel tonnage ample for plate rolling. This means prompt shipment by most eastern Pennsylvania mills. Most consumers are buying on short de-

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Thousands of metal working people are using the Crucible Tool Steel Selector to determine exactly which type of steel they need. This handy selector covers 22 tool steels which fit 98% of all tool steel applications.

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Sub-Group — Special Purpose

Tool Characteristics — Wear Resistance

Tool Steel — Airdi 150

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TOOL STEELS

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livery basis and February schedules are filling slowly. Plate mills are not absorbing freight with delivered price variations under $2 per ton. Shipments of specialty items also are improved, with heads five to seven weeks; clad stock, eight weeks. Demand for pressed heads has declined slightly.

Philadelphia — Operations at district plate mills reflect the continued lag in that product. Ingot operations vary from less than 25 per cent to possibly as much as 80 per cent. Rolling operations in a couple of instances do not amount to more than three days a week. February bookings for district plate mills could be, and probably will be, better than for January, and still leave much to be desired.

Los Angeles—Plates, recently the tightest of all steel products, has eased for local fabricators. Kaiser Steel Corp., Fontana Works, is sold through the first quarter with January set aside for carryover.

Seattle—Small plate shops are in better position with plates in easier supply, but backlogs are down and new orders are eagerly sought. Larger fabricators hold substantial contracts, some of them to carry to the fourth quarter.

Structural Shapes . . .

Structural Shape Prices, Page 130

New York — While several fair sized jobs and one very sizable job (the 25,000-ton Esso Standard Oil office building on 42nd street) are pending, structural buying is light. Most fabricators, however, have substantial bookings and anticipate an appreciable improvement as the spring season approaches. Included in current inquiry are several small schools, involving 100 tons and over.

Boston—Heavy inquiry for structurals is out, 16,325 tons being for bridges, section 2, Augusta extension, Maine Turnpike. Contracts are for fabrication. In addition to bridge work, other inquiry also is stronger. District shop backlogs are holding up well and, in some cases, are more extended.

Philadelphia — While shapes have been relatively one of the stronger steel items, ingot operations at one eastern mill have been nil so far this month, the producer awaiting an accumulation of sufficient business to justify a resumption. Actually, light wide-flange sections are the only shape items in really short supply. Most fabricators and distributors have stocks in good balance, except for these sections, and appear content to coast for the present, or until construction activity comes out of its seasonal slump.

Seattle—Fabricating plants report unchanged operations. Backlogs are not substantial and there is keen competition for new business. Several sizable tonnages, mostly for public works, are pending.

1953 Shipments at Record Pace

New York—Despite lag in closing months, finished steel shipments in 1953 probably established an all-time high.

Figure of 5,903,980 net tons, just issued by the American Iron & Steel Institute, this city, for November, brought the total for the first eleven months up to 74,502,680 tons, or only 4,426,320 tons under the 1951 annual record of 78,929,000 tons.

December shipments, once compiled, will likely bring last year's total above the 1951 peak.

The 11-month total for last year compared with 60,898,840 tons in the corresponding period of 1952—a year adversely affected by the prolonged steel strike. Total for the full year of 1952 was 68,003,012 tons.

Pig Iron . . .

Pig Iron Prices, Page 134

Chicago — Demand for pig iron gives no clue that any upturn in foundry operations is at hand. Automotive requirements for castings are not up to expected volume. Farm machinery offers mild encouragement with some laid-off workers being called back to tractor plants, but it is too small to be really significant.

New York—Pig iron releases are a shade better, but the volume is far from brisk, and most sellers anticipate little more than moderate gains over the next few weeks. Excess consumer inventories have been fairly well worked off. However, there is no pressure for building them up again, especially in view of the early deliveries that are promised by producers generally.

Buffalo—An estimated 85 per cent of current pig iron production is moving into ingot production channels. Merchant pig iron market is uncertain with the automotive industry, temporarily at least, continuing as the leading buyer.

Philadelphia—Pig iron business is slowly improving with little gain over the preholiday rate of activity.

(*Please Turn to Page* 147)

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Made of highest standards and uniform quality thus insuring maximum service.
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Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.
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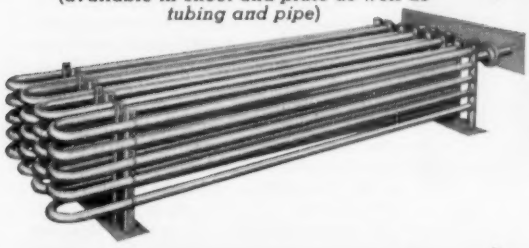
USE *Carpenter* Stainless No. 20

(available in sheet and plate as well as tubing and pipe)



For extraordinary resistance to corrosive attacks by *sulphuric acid* in various concentrations, and free sulphate ions, at temperatures up to boiling. Carpenter Stainless No. 20 is *completely* resistant to arsenic, benzoic, carbonic, citric, fatty, maleic, oleic, picric, pyrogallic, stearic, tartaric and mixed acids; acid-zinc solutions; acetate solvents and a host of other strong corrodents. Its superiority over other corrosion-resistant materials in severe conditions has been amply demonstrated in plants producing synthetic rubber, high-octane gasoline, solvents, explosives, heavy and organic chemicals, pharmaceuticals, metal products, foods, and atomic energy. This super stainless has excellent mechanical properties and is adaptable to all fabricating operations.

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For tubing or pipe that will effectively resist the highly corrosive action of *hydrochloric acid* in all concentrations at all temperatures. Carpenter Alloy B offers strong resistance also to phosphoric acid, other halogen acids, and reducing solutions. Toughness, excellent strength even at elevated temperatures, and workability are other desirable advantages of Alloy B.

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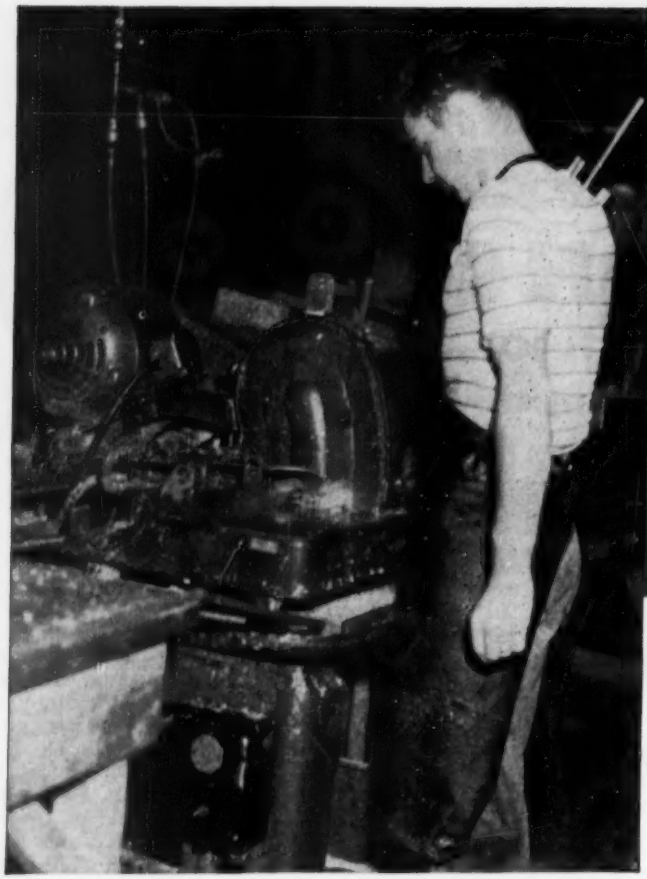


At Orange Screen Co., with an output of 900 pieces per hour, cost of making mitre cuts on aluminum frames on double Delta cut-off saws is only 2.9 cents each, including all charges for depreciation, interest on investment in tools, maintenance, power and labor.

DELTA Cut-Off Saws mitre-cut aluminum frames for 2.9¢* each

*Includes all charges for depreciation, interest on investment in tools, maintenance, power and labor

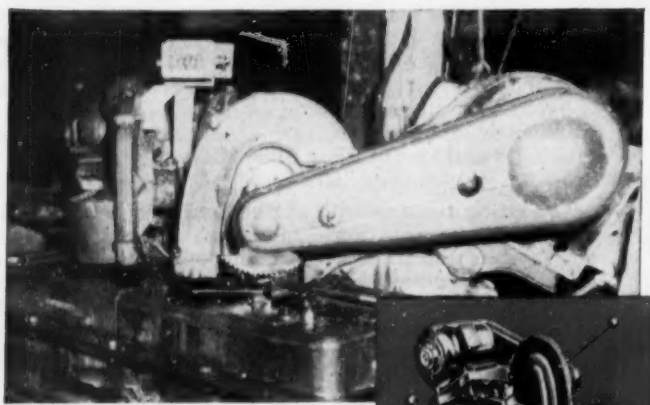
HERE'S HOW ORANGE SCREEN CO. SAVES

Delta abrasive cut-off saws set in pairs and specially tooled make the mitre cuts on both ends of aluminum window frame members at the same time at a cost of 2.9 cents per piece at the Orange Screen Co., Dover, N. J.

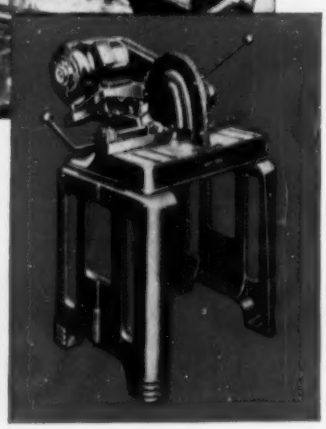
Says E. J. Belliveau, chief manufacturing engineer: *"These set-ups have worked like a charm for nine years. We need their high speed —4000 rpm spindle speed and 10,500 fpm surface speed. An operator—man or woman—can feed an 18' extrusion ½" x ⅜" up to 3" x 1" and turn out 900 pieces per hour. In spite of this fast pace, women operators regularly get incentive production 30 to 80 per cent above base.*

"As a matter of fact, we've standardized on Delta tools all over the plant. Our Delta tools— 20 cut-off machines, 27 drill presses, 3 belt sanders, 5 band saws and 2 circular saws— all have a fine record for accuracy, and with their small initial cost and long life, depreciation is extremely low."

There it is—history repeating itself. Another alert management that's found that low-cost, adaptable, accurate Delta tools out-produce and out-profit far more costly tools. It's easy to find out how you, too, can get these production savings. Talk to your Delta dealer listed in the yellow pages of your phone book under "Tools" or "Machinery." And send for the most useful tool catalog you can have in your desk—Delta AB-Catalog. Delta Power Tool Division, Rockwell Manufacturing Co., 638A North Lexington Ave., Pittsburgh 8, Pa.



Orange Screen Co. keeps blades sharp, uses 10" steel blades that average 36,000 cuts between sharpenings. Maintenance in nine years has been negligible, they report.



DELTA MILWAUKEE®

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DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

Pig Iron . . .

(*Concluded from Page* 144)

Foundry operations are slack and such gain in ordering as is noted reflects mainly some emergency buying for replacement of stocks permitted to get too low.

Cincinnati—Freight absorption is the principal price softening noticeable in the pig iron field. The lack of interest in buying continues with foundries hoping for a change in February.

Birmingham—Demand for pig iron has shown but slight improvement since advent of the new year. Merchant iron melters are confident, however, of an improved market during the first quarter.

Tool Steel . . .

Tool Steel Prices, Page 134

New York — Shipments of high speed and tool steel (exclusive of hollow drill steel) declined in November, reports the American Iron & Steel Institute.

Movement during the month was 8375 net tons, comparing with 9608 in October, and 8960 in November, 1952.

Total shipments during the first 11 months of 1953 were 109,478 net tons, of which 19,822 were class A high speed steel, 3151 tons of class B high speed steel, and 36,505 tons of other tool steels.

In the like period of 1952 shipments amounted to 112,442 net tons, of which 18,334 were class A high speed steel, 2346 class B high speed steel and 91,762 other tool steels.

Comparative data follow:

HIGH SPEED & TOOL STEEL SHIPMENTS
(Net tons. Excluding hollow drill steel)

	1953 November	1952 November	1953 11 Mos.	1952 11 Mos.
Class A				
High Speed ..	1,412	1,405	19,822	18,334
Class B				
High Speed ..	283	229	3,151	2,346
Other Tool Steels	6,680	7,326	86,505	91,762
Total	8,375	8,960	109,478	112,442

Iron Ore . . .

Iron Ore Prices, Page 153

Detroit—Ford Motor Co.'s fleet, increased to three vessels with the addition of one ship last summer, hauled 1,034,042 gross tons of iron ore to the Rouge plant during the 1953 Great Lakes shipping season. The company's vessels also transported 60,851 gross tons of limestone and dolomite during the year.

Vessels of 12 independent companies delivered another 348,260 tons of ore, 504,312 tons of limestone,

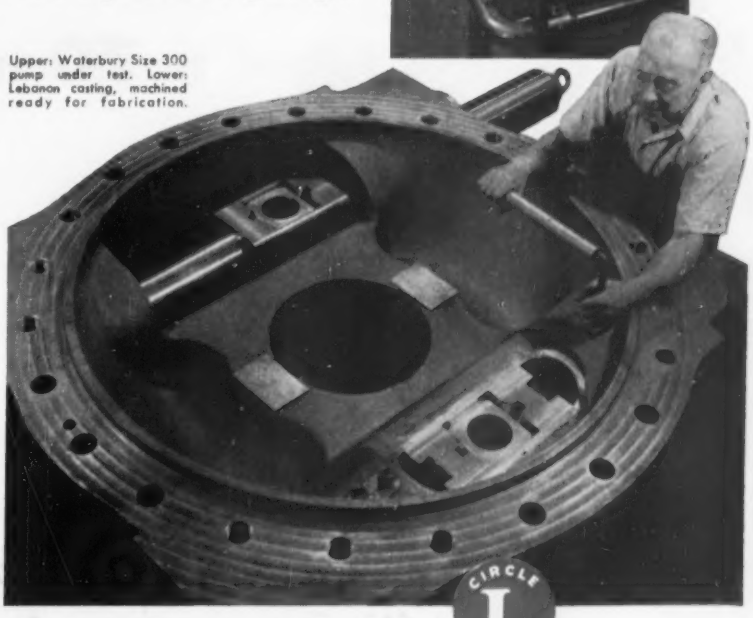
(*Please Turn to Page* 155)

in the

World's Largest

oil hydraulic pumps

Upper: Waterbury Size 300 pump under test. Lower: Lebanon casting, machined ready for fabrication.



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IN WATERBURY TOOL'S SIZE 300 PUMPS—largest oil hydraulic high-pressure pumps ever built—dependable Lebanon CIRCLE (L) castings help confine the tremendous forces developed. These pumps are the working heart of the world's largest tube reducing machine being built by E. W. Bliss Company for Tube Reducing Corporation. On the tube reducer these pumps will move the equivalent of three fully loaded freight cars three feet forward and three feet backward—every two seconds! Each pump weighs 21½ tons, is capable of delivering 2300 gallons per minute at pressures up to 3000 p.s.i. and can transmit up to 4000 H.P.

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●See—STEEL WITH A THOUSAND QUALITIES—37-min., 16 mm, semi-technical, full-color, sound film on the making of steel castings. For information write: Dept. B, Lebanon Steel Foundry.

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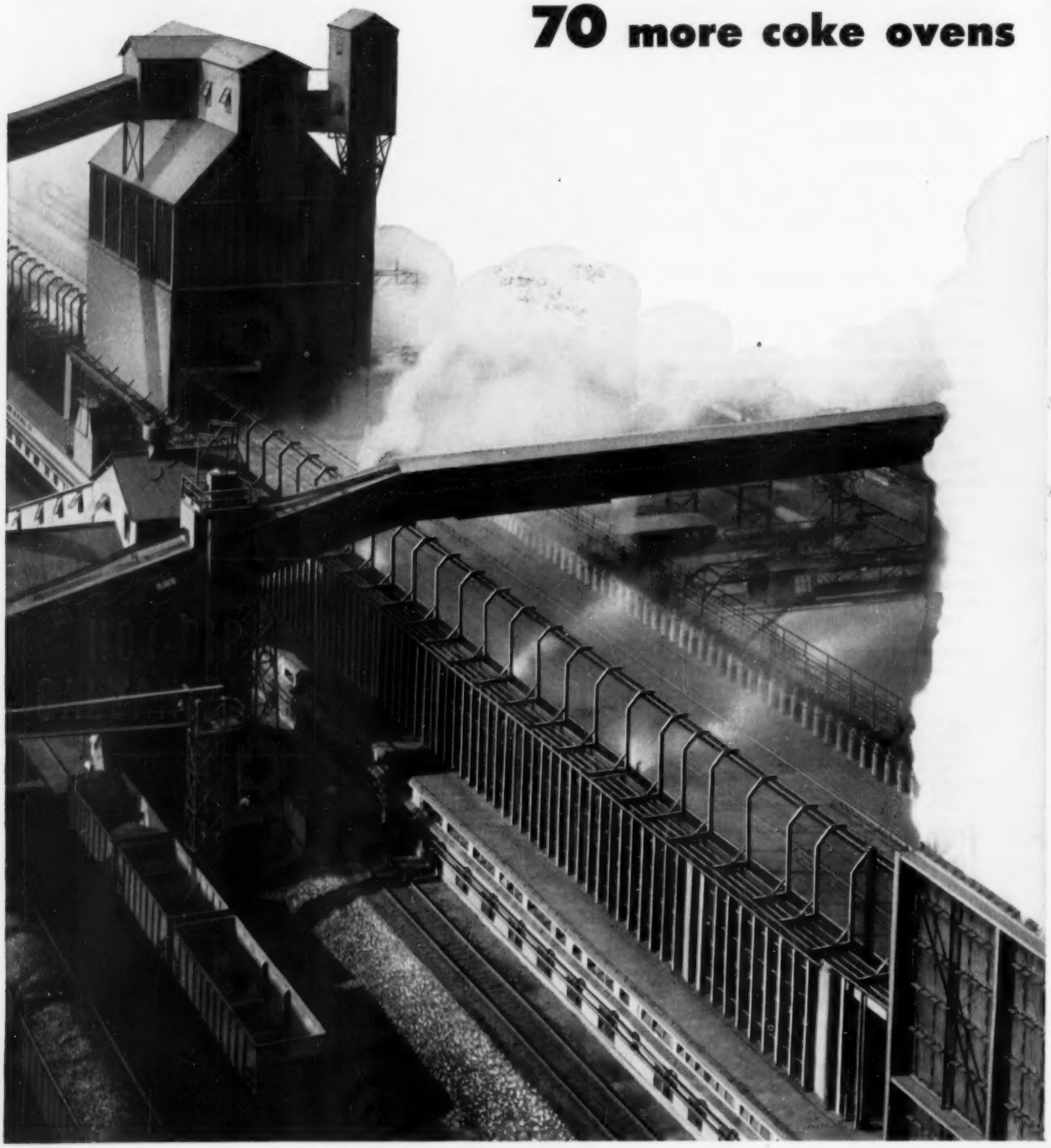
Now in Operation...

70 more coke ovens



to help make 4 million ingot tons of steel

This week, another installation in Great Lakes Steel's expansion goes to work. Seventy new coke ovens are going on the job to help us increase our service to the automotive and other industries which use flat-rolled steel.

From these ovens will come the additional coke required for fuel in the blast furnaces, a part of the integrated and balanced facilities which now give us a steel making capacity of *4 million ingot tons annually.* This illustration gives a "behind the scenes" glimpse of what's necessary to maintain our full integration and provide the balance in facilities necessary to insure customer satisfaction.

Because Great Lakes Steel is completely integrated and in balance, it is more than ever a dependable first source of flat-rolled steel. Starting with ore, we work it through our own blast furnaces, bessemers, open hearths, blooming mills, hot and cold rolling mills and merchant mills, right down to the finished forms.

And at our plant the steel-making and finishing capacities are geared to guarantee the kind of service a manufacturer can count on in the future, as well as the present. *Great Lakes Steel Corporation, Detroit 29, Mich.*

Offices also in Chicago, Cleveland, Grand Rapids, Lansing, New York, Philadelphia, St. Louis and Toledo.

Great Lakes Steel

NATIONAL STEEL CORPORATION

GREAT THINGS HAPPEN AT GREAT LAKES STEEL

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (16-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr, 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.24 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contact, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 010% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carboriam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ¼ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more, $3.50 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%), Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr. 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

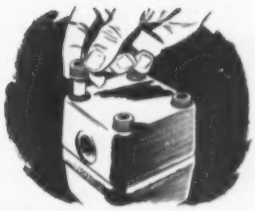
Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

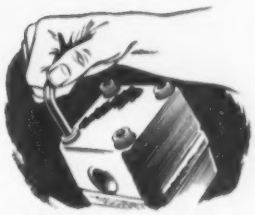
Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Four UNBRAKO Socket Head Cap Screws speed assembly in the plant, and reassembly in the field, of these flow-control valves providing 16 different inlet-outlet flow direction combinations.



The knurling on the head of the screw permits faster assembly, because it provides a slip-proof grip.



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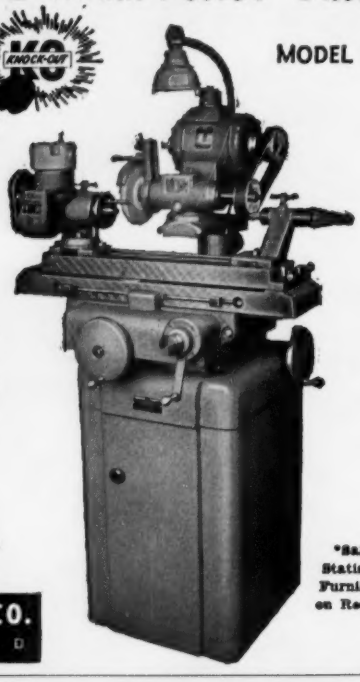

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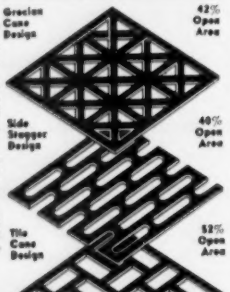

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Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown 'n italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	22.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 60%, WO_3	23.80
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.12 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; 46-47%, $1.05-$1.07.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb Mb content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60, Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	26.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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AMBLER, PA.

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Pattern 6-WL

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You'll find a thousand cost-reducing, profit-making uses for RIGID-TEX METALS—especially in times when the choice of the *right* metal means the success of your products. (Available in all ferrous and non-ferrous metals—solid or perforated—sheet or strip.)

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Plant at W. Warwick, Rhode Island
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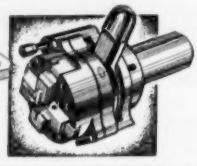

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Iron Ore . . .

(*Concluded from Page* 147)

486,402 net tons of sand, more than 2 million net tons of coal, and 285,022 gross tons of pig iron to the Ford docks and storage areas during the 1953 season.

A total of 715 vessels docked at the Rouge during the season.

Scrap . . .

Scrap Prices, Page 156

Buffalo — Scrap prices plunged $2.50 a ton in the local area last week as dealers were unable to find buying interest. Three leading mill consumers remained out of the market. Dealers are hoping that the six-point rebound in ingot production to 71 per cent of capacity will bolster market sentiment. However, supplies in dealers' hands are expanding at an "alarming" rate. All grades of scrap, including cast, were included in last week's price drop.

Boston—At current steel scrap price levels, yard activity has practically ceased. Adverse weather conditions also have restricted intake by yards. Prices went to the lowest level since controls were lifted. Consumers have substantial inventories and are doing practically no new buying. With open-hearth operations tottering, immediate outlook is bleak. This holds true also for cast grades, with foundry melt making little or no recovery from the slump which has been evident for several months.

New York—Brokers' buying prices for steel scrap are nominally unchanged. No. 1 heavy melting and No. 1 bundle prices are $20; No. 2 heavy melting, $17, and No. 2 bundles, $15. Business in these grades show few early signs of pick-up, as leading consumers still have substantial inventories on hand. Outlook in borings and turnings and in low phos scrap also is dull. Cast grades are moving in small quantities at unchanged prices.

Philadelphia — Trading in open-hearth scrap remains at a virtual standstill. Prices are easy, but there has not been sufficient trading to establish any quotable change in the major grades.

Short shovel turnings are off $1 on light trading to $22, delivered consumer plant. Other grades of turnings are nominally unchanged, as are structurals and plate. Rail crops are a shade higher at $42-$44.

Situation in cast scrap is featured by a drop of $2 a ton to $34-$35, delivered, in heavy breakable.

Pittsburgh — No important purchases have taken place for three weeks. Prices continue their downward trend. While most open-hearth and cast grades held their price levels, No. 1 railroad heavy melting scrap dropped to a range of $31.50 to $32.50. No change is reported in No. 1 heavy melting, which last sold for $31.

Cleveland—Scrap prices remain unchanged here in a dull market. Mills are not placing new orders and are using an increasingly large tonnage of material, such as waste-wasters, that had found a ready market up to a few months ago. Brokers hope that mills will soon decide to use a larger ratio of scrap in open-hearth melts. Recently, the trend has been to use more pig iron.

Chicago—A steelmaking rate of 78 per cent of capacity and generous scrap inventories at mills continue to stifle trading in this commodity. The effect is to depress the price structure. The pressure is unrelenting and each passing week witnesses further loss of ground. No. 1 factory bundles and No. 1 railroad heavy melting are off $1 a ton to $31 and $32, respectively. Blast furnace material and cast grades also are devoid of strength.

Birmingham—The scrap market remains generally on the weak side. A moderate tonnage of melting steel is being taken by interests outside the district and No. 2 melting, most in demand here, is rather scarce. Considerable export of melting steel from Florida sources is reported. Cast is not in much demand here.

New prices on plate and structural are $31 to $32; bar crops and plate, $31 to $32; shoveling turnings, $17 to $18; cast iron borings, $17 to $18.

Luria Steel & Trading Corp. is closing its office here and withdrawing from the South. The company opened here in 1941 as the Phillip W. Freider Co. and since 1947 has been the Phillip W. Freider Division of Luria. Mrs. Margaret Heath was manager.

Los Angeles—Movement of steelmaking scrap has virtually ceased with all mills out of the market. With not enough transactions to establish a price level, prices are nominal.

San Francisco—Mills, which have been out of the market for scrap for weeks, have given no indications of when they may return. Despite the lethargy in the movement of scrap, prices remain unchanged at levels they have held for the last six weeks to two months. Cast grades are the better movers and prices there are firm.

Seattle—The scrap market is fairly steady at $27 and $23, respectively, for No. 1 and No. 2 heavy melting. However, the situation looks soft as dealers' stocks are large and mills have comfortable inventories and are not buying in volume. One Seattle firm bought 1,500 tons of Navy unprepared scrap on a bid of $24, which is $3 above the market, buyer also assuming freight to plant. No export sales are reported in this area but three full cargo charters from California ports to Japan have been reported, at $72,000, $65,500 and $65,000 respectively; Hawaii to Japan has been done at $55,000. On the basis of 9000 tons per cargo, these rates run from $6 to $8 a ton, shipper paying loading and discharge costs which will average close to $4 a ton.

Canada . . .

Toronto, Ont.—Canadian steel producers have made downward revisions in base prices of some lines of steel and at the same time introduced new extras on carbon bars. The new list of extras for carbon bars is somewhat similar to the one put into effect by United States producers last year.

Steel Co. of Canada Ltd., Hamilton, Ont., announced the following revised prices for tin plate effective to Mar. 31, per 100 lb box, f.o.b. Hamilton mill: Common cokes, $9.70; No. 25 electrolytic, $8.20 and tin mill black plate, $7.04.

Effective Jan. 11, Steel Co. of Canada Ltd. reduced the base price on carbon bars to $4.73; plate to $4.60 and nails to $6.36 per 100 lb, Toronto. At the same time, a new list of extras was issued for carbon bars.

Supply of iron and steel in Canada has eased with the only tight items on the list being cold rolled sheets and galvanized sheets. There has been some slackening in demand with the result that mills still have unfilled capacity to the end of March. Consumers are taking a more cautious attitude in their buying and are giving special attention to inventories. From long-term contract placing, consumers have returned to hand-to-mouth buying and materials are being purchased as needed rather than to maintain high inventories. However, mill representatives are not greatly concerned over delayed order placing and do not look for any serious slump in overall demand for the next few months.

Competition for Canada's steel business is building rapidly both from domestic and outside sources. Cana-

(*Please Turn to Page* 158)

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commision, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 21	$29.17
Jan. 14	29.17
Dec. Avg.	32.10
Jan. 1953	43.00
Jan. 1949	41.64

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	30.00-31.00
No. 2 heavy melting...	27.00-28.00
No. 1 bundles	30.00-31.00
No. 2 bundles	25.00-26.00
No. 1 busheling	30.00-31.00
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings..	20.00-21.00
Cast iron borings	20.00-21.00
Cut structurals	36.00-37.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	34.00-35.00
Electric furnace bundles	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	34.00-35.00
Heavy breakable cast..	32.00-33.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast..	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*31.50-32.50*
Rails, 2-ft. and under.	46.00-47.00
Rails, 18-in. and under.	47.00-48.00
Rails, random lengths..	39.00-40.00
Railroad specialties	*34.00-35.00*

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids..	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids...	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting...	28.00-29.00
No. 2 heavy melting...	24.00-25.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Machine shop turnings.	14.00-15.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings..	18.00-19.00
Cast iron borings	18.00-19.00
Low phos.	30.00-31.00
Alloy free, short shovel turnings	21.00-22.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	29.00-30.00
Stove plate	36.00-37.00
Heavy breakable cast..	25.00-26.00
Unstripped motor blocks	24.00-25.00
Brake shoes	33.00-34.00
Clean auto cast	43.00-44.00
No. 1 wheels	39.00-40.00
Burnt cast	30.50-31.50
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
R.R. malleable	42.00-43.00
Rails, 3-ft. and under.	43.00-44.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths.	38.00-39.00
Cast steel	35.00-36.00
Railroad specialties ...	35.00-36.00
Uncut tires	37.00-38.00
Angles, splice bars ...	41.00-42.00
Rails, rerolling	42.00-43.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids....	nom. 160.00-170.00
18-8 turnings .....nom.	70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting...	29.00-30.00
No. 2 heavy melting...	28.00-29.00
No. 1 bundles	29.00-30.00
No. 2 bundles	27.00-28.00
Machine shop turnings.	15.00-16.00
Short shovel turnings..	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	31.00-32.00
Electric furnace bundles	31.00-32.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	28.00
No. 2 heavy melting...	25.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 1 busheling	28.00
Electric furnace bundles	30.00
Machine shop turnings.	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	*22.00*
Structurals & plate ...	32.00
Heavy turnings	27.00
Couplers, springs, wheels	35.00-36.00
Rail crops, 2 ft & under	*42.00-44.00*

Cast Iron Grades

No. 1 cupola	33.00-35.00
Heavy breakable cast.	*34.00-35.00*
Unstripped motor blocks	28.00
Drop broken machinery	40.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	20.00
No. 2 heavy melting...	17.00
No. 1 bundles	20.00
No. 2 bundles	15.00
Machine shop turnings	9.00-10.00
Mixed borings, short turnings	12.00-13.00
Low phos. (structural & plate)	26.00-27.00
Short shovel turnings..	13.00-14.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids 160.00-165.00	
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	75.00-80.00
410 sheets, clips, solids	65.00-70.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*17.25-18.25*
No. 2 heavy melting	*15.00-15.25*
No. 1 bundles	*17.25-18.25*
No. 2 bundles	*13.50-14.00*
Machine shop turnings	*5.50-6.00*
Mixed borings, turnings	*7.00-7.50*
Short shovel turnings	*9.00-10.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast.	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	26.00-27.00
No. 2 heavy melting...	23.00-24.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
No. 1 busheling	26.00-27.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings..	14.00-15.00
Cast iron borings	14.00-15.00
Low phos., 18-in.	34.00-35.00

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast..	34.00
Charging box cast	34.00
Drop broken machinery	44.00

Railroad Scrap

No. 1 R.R., heavy melt.	28.00-29.00
Malleable	35.00-36.00
Rails, 18-in. and under.	44.00-45.00
Rails, random lengths..	36.00-37.00

CHICAGO

No. 1 heavy melting...	28.00-30.00
No. 2 heavy melting...	23.00-24.00
No. 1 factory bundles	*30.00-31.00*
No. 1 dealer bundles..	27.00-28.00
No. 2 bundles	21.00-23.00
No. 1 busheling	28.00-30.00
Machine shop turnings.	11.00-12.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings..	13.00-14.00
Cast iron borings	13.00-14.00
Cut structurals, 3-ft ..	32.00-33.00
Punchings & plate scrap	33.00-34.00
Electric furnace bundles	*31.00-32.00*

Cast Iron Grades

No. 1 cupola	32.00-33.00
Stove plate	26.00-27.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	36.00-37.00
Drop broken machinery	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	*31.00-32.00*
R.R. malleable	39.00-40.00
Rails, 2-ft. and under.	43.00-44.00
Rails, 18-in. and under	44.00-45.00
Angles, splice bars ...	38.00-39.00
Rails, rerolling	37.00-39.00

Stainless Steel Scrap

18-8 clips & solids ..	130.00-140.00
18-8 turnings	60.00
430 clips & solids	52.50
430 turnings	nom. 25.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	23.00
No. 2 heavy melting..	18.50
No. 1 bundles	23.00
No. 2 bundles	18.50
No. 1 busheling	23.00
Machine shop turnings	10.00
Mixed borings, turnings	10.00
Short shovel turnings..	12.00
Punchings & plate scrap	24.00

Cast Iron Grades

No. 1 cupola	35.00
Charging box cast ..	25.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	30.00

BUFFALO

No. 1 heavy melting	*24.50-25.50*
No. 2 heavy melting	*21.50-22.00*
No. 1 bundles	*24.50-25.50*
No. 2 bundles	*19.50-20.00*
No. 1 busheling	*24.50-25.50*
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*14.00-14.50*
Short shovel turnings	*15.00-15.50*
Cast iron borings	*14.00-14.50*
Low phos.	*28.50-29.50*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*27.50-28.50*
No. 1 machinery	*32.50-33.50*

Railroad Scrap

Rails, random lengths	*31.50-32.50*
Rails, 2 ft and under	*36.50-37.50*
Railroad specialties	*34.50-35.50*

BIRMINGHAM

No. 1 heavy melting...	26.00-26.50
No. 2 heavy melting...	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Cast iron borings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Machine shop turnings	19.00
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate ...	*31.00-32.00*
Plate and structurals ..	*31.00-32.00*
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft. and under.	42.00-43.00
Rails, random lengths.	39.00-40.00
Angles, splice bars ...	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	27.00
No. 2 heavy melting..	25.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings.	12.00
Short shovel turnings..	12.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	27.00
Heavy breakable cast..	27.00
Unstripped motor blocks	27.00
Brake shoes	36.00
Clean auto cast	37.00
Burnt cast	26.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00
Rails, 18-in. and under	43.00
Rails, random lengths.	36.00-37.00
Rails, rerolling	38.00-39.00
Uncut tires	30.00-31.00
Angles, splice bars	34.00-35.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting...	27.00
No. 2 heavy melting...	23.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings.	12.00
Mixed borings, turnings	12.00
Short shovel turnings..	12.00
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	35.00-37.00
Heavy breakable cast..	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths.	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting..	23.00
No. 2 heavy melting..	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings..	11.00
Cast iron borings	11.00
Cut structurals	28.00
Heavy turnings	11.00
Punchings & plate scrap	28.00
Electric furnace bundles	22.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting..	23.00
No. 2 heavy melting..	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00-41.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting...	$29.00
No. 2 heavy melting...	26.00
No. 1 bundles	29.00
No. 2 bundles	*24.00*
Mixed steel scrap	23.00
Mixed borings, turnings	17.00
Rails, remelting	38.95
Busheling new factory:	
Prepared	27.00
Unprepared	23.00
Short steel turnings....	17.00

Cast Iron Grades†

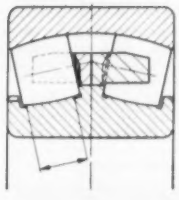
No. 1 machinery cast..	43.00

†F.o.b., shipping point.

the SKF improvement of internal design of spherical roller bearings

Increases capacity 25% to 50%

increases service life 2 to 3½ times

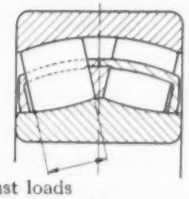


This is the Spherical Roller Bearing design originated by SKF *more than 30 years ago.* The cross-section shows how the integral inner ring flanges, and the undercuts adjacent thereto, limit the effective length of the rollers.

Now, SKF, originator of the Spherical Roller Bearing, has again provided industry with another anti-friction *first.*

This time, it's a revolutionary design advance in Series 222 and 223 bearings providing these advantages:

When designing new equipment, you can obtain the desired life by using smaller or lighter bearings at considerable cost saving. In addition, this forward step in design will carry heavier combinations of radial and thrust loads, or pure thrust loads of greater magnitude. The important self-aligning feature of SKF Spherical Roller Bearings has been preserved, so that considerable misalignment between the shaft and housing has no ill effect whatever on bearing capacity or life.



Here is the latest SKF improvement, a *revolutionary advance in design.* Effective roller guiding is accomplished by means of a separate ring. The need for undercuts is eliminated! This type of guide ring permits the rollers to take the position which their contact with the rings dictates. This assures uniform load distribution over the entire length of the longer rollers at all times. *Result*—greatly increased capacity and life.

During more than 4 years, thousands of installations have been made in railroad journals, vibrating screens, steel mill machinery and numerous other fields. In all cases performance has been outstanding.

SKF Sales Engineers in our District Offices throughout the country will assist you in making use of the important advantages of the improved internal design of SKF Spherical Roller Bearings. **SKF INDUSTRIES, INC.,** Dept. 616, PHILADELPHIA 32, PA.
— *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

7424

This 12-page booklet gives you additional facts—sizes available—added capacity, size by size—increased life you can expect for each size—dimensional tabulations—and load and speed data. Write now for your free copy of Booklet No. 365-2.

SKF®
BALL AND ROLLER BEARINGS

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Canada . . .

(*Concluded From Page* 155)

dian mill representatives are finding more competition from European producers, especially in the small items such as nails, wire, bolts, and nuts. This competition may increase with the opening of St. Lawrence navigation.

Reflecting the slackening demand, Steel Co. of Canada Ltd., has closed down its No. 1 open-hearth shop, an obsolete unit, which will be dismantled. However, the company put its new open-hearth shop into production last year and this will more than offset any loss due to the closing of the old furnaces.

Tungsten Ore . . .

New York — Softness in tungsten ore prices is reflected in tungsten alloys and tungsten metal powder. Ferrotungsten, 70 to 80 per cent, 5000 lb W or more, has been reduced to $3.80 per lb of contained W; 2000 lb W to 5000 lb W, to $3.90; and less than 1000 lb W, to $4.02.

Tungsten metal powder, melting grade, 99 per cent, 60 to 200 mesh, is now quoted by one leading producer at $4.95 for 1000 lb and over and $5.10 for less than 1000 lb, a reduction of 40 cents in each case.

The whole tungsten situation is in a state of flux, with prices still unsettled and subject to further change.

Geneva Works Sets Record

Salt Lake City, Utah — Geneva Works of Columbia-Geneva Steel Division, U. S. Steel Corp., produced 1,853,118 tons of steel ingots in 1953, a new high.

Iron production at the big Utah plant totaled 1,399,332 tons. An additional 284,106 tons were turned out at the nearby Ironton plant. The two blast furnaces at Ironton now are out of production and are on a standby basis.

Furnace coke production amounted to 1,128,296 tons at Geneva and 243,971 tons at Ironton in 1953.

Finished steel products at Geneva totaled 1,437,576 tons.

Ore production by Columbia Iron Mining Division, U. S. Steel Corp. at Iron county, Utah, mines amounted to 3,319,046 tons.

Titetlex Sells Filter Line

Titeflex Inc., Newark, N. J., sold the design and manufacturing rights of its industrial filter for the chemical and processing markets to Croll-Reynolds Engineering Co. Inc., New York. Titeflex is a manufacturer of flexible metal hose and a wide range of aviation components. Croll-Reynolds makes packless bellows-type expansion joints and shell and tube heat-transfer apparatus for process industries. An associate firm, Croll-Reynolds Co. Inc. makes steam-jet vacuum equipment.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1300 tons, Pennsylvania Railroad, Liberty street bridge, Pittsburgh, to American Bridge Division, United States Steel Corp., that city.

970 tons, gymnasium, Providence College, Providence, R. I., to A. O. Wilson Structural Co., Cambridge, Mass.; Gilbane Building Co., Providence, general contractor.

670 tons, office building, Factory Mutual Insurance Co., Norwood, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

600 tons, steel piling, temporary railroad trestle, Winchester, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Berke-Moore Co., Boston, general contractor.

500 tons, including miscellaneous and reinforcing steel, gas compressor station, United Fuel Gas Co., Credo, W. Va., to Havens Structural Steel Co., Kansas City, Mo., and Joseph T. Ryerson & Son Inc., Chicago; J. F. Pritchard & Co., Kansas City, general contractor.

300 tons, building, Table Talk Bakery, Worcester, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; John Capobianco, Boston, general contractor.

260 tons, three state bridges, Windsor, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Della-Bitta-Bassola Inc., Plantsville, Conn., general contractor.

225 tons, two-span continuous welded girder bridge, Wilbur Cross highway, Union, Conn., to Phoenix Bridge Co., Phoenixville, Pa., through Jarvis Construction Co., Manchester, Conn., general contractor.

150 tons, warehouse, New England Telephone & Telegraph Co., Watertown, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; direct from owner.

100 tons, building, Boston College high school, Boston, to A. O. Wilson Structural Co., Cambridge, Mass.; Walsh Bros., Cambridge, general contractor.

100 tons, building, Y.M.C.A., Cambridge, Mass., to A. O. Wilson Structural Co., that city; Tredennick-Billings Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

14,515 tons, shop fabrication, superstructures, 87 beam span bridges, Maine turnpike, section two, Portland to Augusta; bids Jan. 28, Maine Turnpike Authority, Portland; contracts to be let under single contract or under three separate contracts consisting of 17, 11 and 59 bridges; work also includes 430 tons bearing devices and anchor bolts.

2200 tons, double cantilever maintenance hangar, Larson Airfield Base, Moses Lake, Wash.; bids about Mar. 10, Corps of Engineers, Walla Walla, Wash.

1810 tons, bridge, Androscoggin river, Maine turnpike, section two, Portland to Augusta; bids Jan. 28, Maine Turnpike Authority, Portland; work also includes 31 tons, bearing devices and anchor bolts.

1000 tons, marine transfer terminal, Department of Public Works, 135th St., New York; bids asked.

1000 tons, Phelps Memorial Hospital, Mt. Pleasant, N. Y.; pending.

750 tons, steel bridge superstructure, Deerfield river, Buckland-Shelburne, Mass.; bids Feb. 9, Boston, direct on steel.

500 tons or more, outlet gates, Palisades dam, Idaho; Goslin Birmingham Mfg. Co. Inc., Birmingham, apparently low $598,400, to Bureau of Reclamation, Denver.

300 tons, high school, Johnsville, Pa.; bids asked.

300 tons, Manhattan wharf, New York Port Authority, New York; pending.

250 tons, central heating plant, airfield base, Portsmouth, N. H.; bids in Corps of Engineers, Boston.

100 tons, classified project at Hanford Works; bids in Jan. 19.

REINFORCING BARS . . .

REINFORCING BARS PLACED

755 tons, W. Wacker Drive parking garage, city of Chicago, to Joseph T. Ryerson & Son Inc., Chicago; Herlihy Mid-Continent Co., Chicago, contractor.

250 tons, Lake Meadows housing development, Chicago, for New York Life Insurance Co., to Concrete Steel Co., Chicago; B. W. Handler Construction Co., contractor.

175 tons, four rolled-beam bridges, Middletown, Conn., to Bethlehem Steel Co., Bethlehem, Pa., through Jarvis Construction Co., Manchester, Conn.

100 tons, or more, gymnasium, Providence College, Providence, R. I., to Plantations Steel Co., that city; Gilbane Building Corp., Providence, general contractor.

100 tons, three state bridges, Windsor, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Della-Bitta-Bassola Inc., Plantsville, Conn., general contractor.

REINFORCING BARS PENDING

1100 tons, S. Wacker Drive parking garage, city of Chicago, Herlihy Mid-Continent Co., Chicago, low on general contract.

265 tons, underpass, Soldiers Field road, Boston, Coleman Bros. Co., Boston, low, general contract.

200 tons or more, Washington state freeway bridge, Vancouver; general contract to N. Fiorito Co., Seattle, low $877,432.

140 tons, Washington state highway bridges, Clark and Cowlitz counties, bids to Olympia, Feb. 2.

120 tons, two T-beam Washington state bridges, King county; bids to Olympia, Feb. 2.

100 tons or more, Washington state highway bridges, Lewis and Clark counties; general contracts to Pakar Construction Co., Chehalis, Wash., low $162,894 and Henry Hagman, Cashmere, low $62,833.

100 tons, including shapes and miscellaneous, railroad relocation, The Dalles dam; bids to U. S. Engineer, Portland, Oreg., Jan. 28.

PLATES . . .

PLATES PLACED

500 tons, estimated, tanks for Esso Standard Oil Co., Baltimore, to Chicago Bridge & Iron Co., Chicago, on a bid of $290,000.

300 tons, 18 welded cylindrical tanks, Corps of Engineers, Philadelphia, to Gary Steel Products Corp., Lynchburg, Va., total $119,610.

PLATES PENDING

350 tons, water storage tank, Spokane, Wash.; Pittsburgh-Des Moines Steel Co., Seattle, low.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, 12 to 6 inch; bids to Spokane, Wash., Jan. 21.

300 tons, 24 inch; American Cast Iron Pipe Co., low, to Portland, Oregon.

100 tons, 6 inch and fittings; bids to Gertrude Hutchins, clerk, Ellensburg, Wash., Feb. 1.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago, Rock Island & Pacific, 100 box cars and 100 covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD EQUIPMENT—*FOR SALE*

USED AS IS RECONDITIONED

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity

Box, Double Sheathed, 50-Ton Capacity

Box, Single Sheathed, 50-Ton Capacity

Flat, 50-Ton, Steel Underframe, 40'6" Long

Gondolas, Composite, or All Steel 50-Ton and 70-Ton

Hoppers, Twin, All-Steel, 50-Ton, Cross Dump

Ore Hoppers, All-Steel, 50-Ton, Heavy Duty

Tank, 3,000-Gallon, High Pressure

Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

CABOOSE CARS

Eight Wheel, Cupola Type

AUSTIN-WESTERN 30-YARD AIR DUMP CARS; STANDARD GAUGE; 50-TON, SIDE DUMP, DROP DOOR

OTHER EQUIPMENT

Jordan Spreader — Overhead Cranes

Locomotive Cranes — Railroad Track Scales

ONE ALCO STANDARD GAUGE DIESEL-ELECTRIC LOCOMOTIVE

100-TON, 600 H.P., TYPE 0-4-4-0

NEW AND RELAYING RAIL

Send us your inquiries

SERVICE-TESTED REPAIR PARTS For All Types of Freight Cars

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Send us your offerings

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED ADVERTISING

Positions Wanted

PLANT OR PRODUCTION MANAGER. Experience covers all phases of plant operation and control, including, costs, methods improvement, incentives and labor relations. M.I.T. graduate. Reply Box 868, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER—20 years' experience in Plant Management, Production Control, Manufacturing Development. Could invest. Age 45, married, family. Reply Box 890, STEEL, Penton Building, Cleveland 13, Ohio.

Accounts Wanted

KINDRED ACCOUNTS WANTED

Successful Sales Organization in Western New York, warehouse distributors and sales agents of bronze, steel and cast iron products, now desires additional kindred accounts. Our experienced and technical sales force can sell your product in this area. Reply Box 902, STEEL, Penton Building, Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N. Y.

Help Wanted

FOUNDRY METALLURGIST required with experience in cast iron foundry practice. Prepared to travel. State age, experience, and salary required. Reply Box 892, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED a technologist experienced in cast iron and foundry practice. Prepared to travel. State salary required and full qualifications. Reply Box 893, STEEL, Penton Building, Cleveland 13, Ohio.

Help Wanted

FABRICATED STRUCTURAL STEEL SALESMAN and ESTIMATOR familiar with Metropolitan New York building contractors. Give complete qualifications and state salary expected. Reply Box 907, STEEL, 60 East 42nd St., New York 17, N. Y.

SALES AGENTS, on a commission basis, to represent Nationally known manufacturer of seamless and welded steel tubing and tubular parts, in the Syracuse, New York and St. Louis, Missouri areas. Prefer men with engineering or metallurgical background already established with other non-competing industrial accounts. State age, education, present business connections and military status. Information confidential. Reply Box 896, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED, FULL TIME SALESMAN to contact industrial accounts in the New England states for Nationally known manufacturer of seamless and welded tubing, and forged and fabricated tubular parts. Some background in steel essential. Engineering or metallurgical training preferred. To work from established New York City office. Residence within commuting distance necessary. State age, education, business experience and military status. Information confidential. Reply Box 897, STEEL, Penton Building, Cleveland 13, Ohio.

POSITIONS VACANT CLASSIFICATION

Structural Engineer and Detailer, Formal Education and Degree desirable but not required. 4 years' experience detailing absolutely essential. Shop and estimating experience helpful. Small shop in middle west doing light structural, miscellaneous and reinforcing. We are looking for top man who has reached a block in his present position and has capabilities of eventually assuming complete responsibilities. Reply Box No. 905, STEEL, Penton Building, Cleveland 13, Ohio.

GENERAL SUPERINTENDENT

Midwest steel plate fabricator including storage tanks and pressure vessels offers excellent opportunity to man qualified by experience to supervise production, scheduling, engineering and plant maintenance. Give full details as to qualifications, experience and salary required. Replies strictly confidential. Reply Box 906, STEEL, Penton Building, Cleveland 13, Ohio.

TANNEWITZ

DI-SAWS, VARIABLE SPEED BAND SAWS, FRICTION SAWING BAND SAWS, SPECIAL SAWING MACHINERY. Write or phone

The TANNEWITZ WORKS
Grand Rapids, Mich., Ph. GL-4-1729

RELAY RAILS
AND ACCESSORIES
Largest Inventory on Pacific Coast
DULIEN STEEL PRODUCTS, INC.
OF WASHINGTON
P. O. Box 3386 Seattle 14, Wash.

WANTED

For early delivery used extrusion press in good condition for aluminum extrusion 1200-ton or larger. Quote price with complete specs.

Reply Box 908, STEEL
Penton Building Cleveland 13, Ohio

INDUSTRIAL STEEL CONTAINERS

800—USED

10 Ga. galv. riveted shipping containers, 33" high by 24" dia. with water tight rubber gasket sealed removable lid. Jaybolt fastened, weight 127#. Can be used for transportation of chemicals, paints, solvents, metal parts. They are galv., painted Alum., inside and outside. In excellent condition.

Orig. Cost—$40.00 ea.
Our price:—$10.00 ea.
F.O.B. Phila.

Dalton Supply Co.
2829 Cedar St. Phila., Pa.

...if only
for THEIR sakes

...learn how to protect yourself from death from cancer. They need *you!*

And for your sake and theirs you must keep on remembering that the best cancer "insurance" is:

FIRST...*to make a habit of periodic health check-ups no matter how well you may feel, always including a thorough examination of the skin, mouth, lungs and rectum and (for women) the breasts and generative tract.*

SECOND...*to learn the seven danger signals that may mean cancer, and go straight to the doctor at the first sign of any one of them—(1) Any sore that does not heal (2) A lump or thickening, in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.*

For other life saving facts about cancer, phone the American Cancer Society office nearest you, or address your letter to "Cancer"—in care of your local Post Office.

American
Cancer
Society

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Drawing above shows size 200 Cleveland worm gearing which drives bending roll backwards or forwards or by short legs as operator wishes.

Illustration courtesy of Niagara Machine & Tool Works.

CLEVELAND worm gearing drives Niagara bending roll

FINGER-TIP controls on this new 6" Bending Roll reverse direction of steel sheets or plates instantly. But sudden stopping, starting and reversing is bad for ordinary gearing. That's why Niagara uses Cleveland size 200 heavy-duty worm gearing for its new series of modern bending rolls.

Worm gearing as engineered by Cleveland is designed especially for this kind of punishing service. Case-hardened steel worm, meshing on long-wearing nickel-bronze gear, is made by master craftsmen to last the life of any driven machine. The compact, right-angle drive takes up little space, permits streamlined design of the machine. And it provides the high reduction ratio of 50: 1!

These are a few of the reasons why machine builders and users standardize on Clevelands when they want powerful drives to operate dependably under all conditions.

Get the facts on Clevelands. Write today for new Catalog 400. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

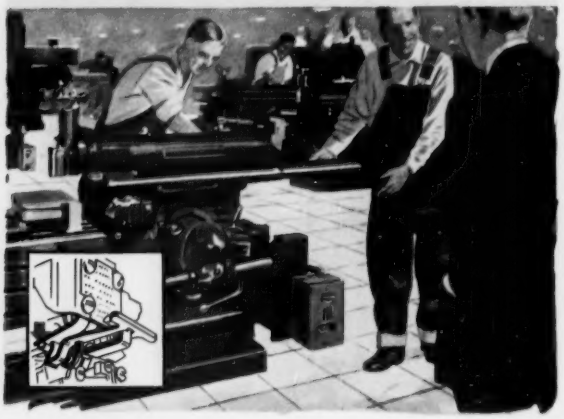
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Drives

THE THREE CUTLER-HAMMER STARS
★ ★ ★
STAND FOR THREE NEW STANDARDS

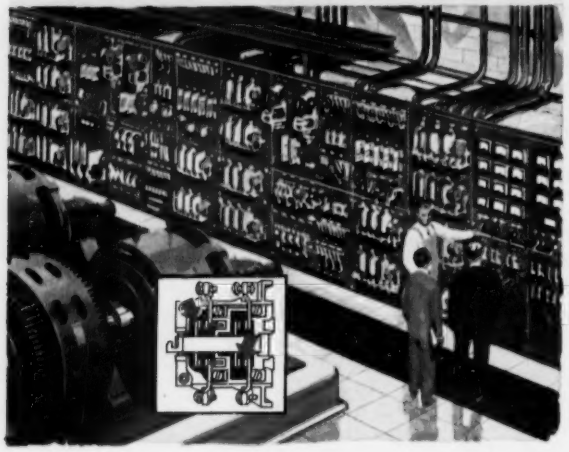
Rolling bearing action...

The proper performance and useful life of *all* modern machines demand anti-friction bearings. Motor control is no exception; it too must have good bearings to avoid wear and trouble.



Dust-safe vertical contacts...

Experienced engineers *know* vertical contacts work better and last longer because they stay clean, shed dust, do not collect it. Pressure arc quenching is important new C-H feature.



☆ *installs easier*
☆ *works better*
☆ *lasts longer*

Less bounce by the ounce...

Research showed contact bounce caused arcing, that reduced weight in moving contact members cut bounce and arcing. So new light-weight parts now remarkably lengthen contact life.

Cutler-Hammer Motor Control has always been respected for its long life. It has frequently been chosen for industry's "killer" jobs by comparative test. Many users say, "I have never seen a Cutler-Hammer starter wear out." Yet the new Cutler-Hammer ☆☆☆ Motor Control has *three times* the life of the good equipment it replaces! Nearly unbelievable, but it IS true. *Now* motor control you can install and forget! Try it. Prove it. Your nearby Cutler-Hammer Authorized Distributor is ready to serve you. Order from him today. CUTLER-HAMMER, Inc., 1211 St. Paul Ave., Milwaukee 1, Wisconsin.

CUTLER-HAMMER ★★★ MOTOR CONTROL